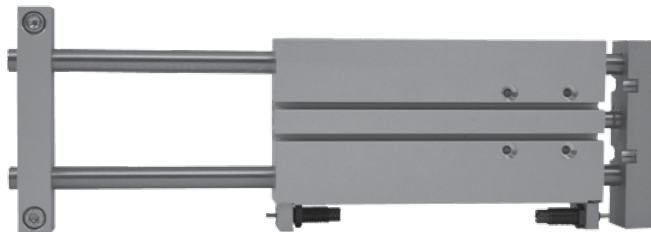
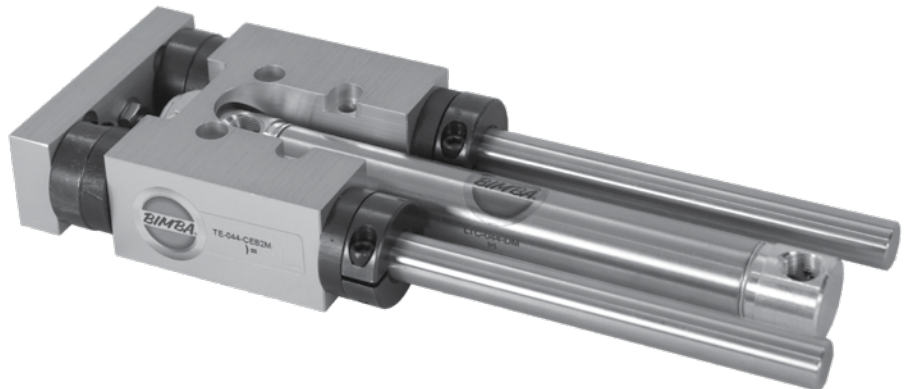




Linear Thrusters

Bimba offers a wide variety of linear thruster options to accommodate applications where side or moment loading can be present. Sleek body designs incorporate a rugged construction and a cylinder integral to the thruster block to create a durable, space-efficient pneumatic cylinder.



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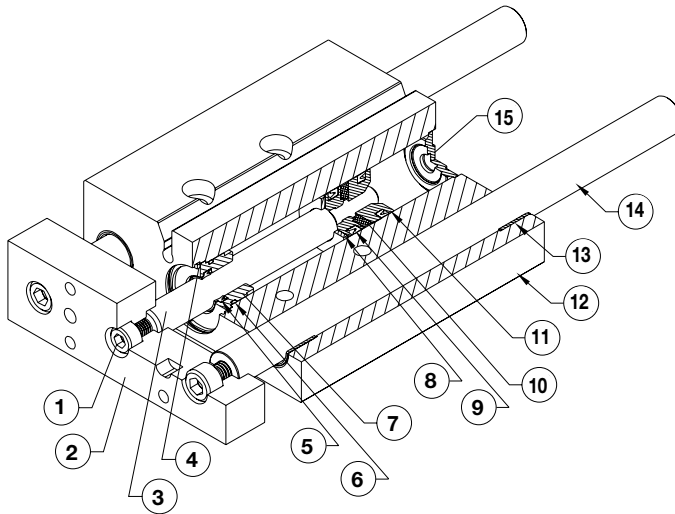
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328 MTC Extruded Thrusters

- 328 – Engineering Specifications
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ET Series Extruded Thrusters

Materials of Construction



Item #	Description	Material
1	Assembly Bolt	Zinc-Plated Steel
2	Tooling Plate	Anodized Aluminum
3	Piston Rod	Hard Chrome Plated Stainless Steel
4	Retaining Ring	Zinc-Plated Steel
5	Rod Seal	Nitrile (Fluoroelastomer optional)
6	Rod Guide Seal	Nitrile (Fluoroelastomer optional)
7	Rod Guide	Anodized Aluminum
8	Bumper	Urethane
9	Piston Seal	Nitrile (Fluoroelastomer optional)
10	Magnet	Nitrile
11	Piston	Aluminum
12	Body	Anodized Aluminum
13	Guide Bushing	Self-Lubricating Nylon Ball Bushings optional
14	Guide Shaft	Stainless Steel Case Hardened Steel with X Option
15	Rear Head	Anodized Aluminum

Engineering Data

- > Rated 250 PSI
- > Low breakaway friction

Components:

- > 303 stainless steel shafts through 2" bore
- > Hardchrome plated shafts for 2-1/2" and 3" bores
- > Clear anodized aluminum housing and tooling plate
- > Plastic composite guide shaft bearings

Cylinder:

- > 304 stainless steel body
- > High-strength aluminum alloy porting ends
- > 303 stainless steel piston rods
- > Buna N "U" cup seals
- > Sintered bronze rod guide bushing

*U.S. Patent nos. 4,794,681 and 4,862,786

NOTE: All product is sold F.O.B. shipping point. Prices are subject to change without notice.

Options:

- > Internal Buna N or external urethane bumpers
- > Patented adjustable cushions*
- > Buna N magnet for position sensing

Temperature Range:

- > Buna N seals with a temperature range of -20°F (-25°C) to 200°F (95°C) are standard in all BIMBA air cylinders. High temperature option V seals rated for higher temperature applications are available. If cylinders are operated at temperatures below 0°F for extended time periods, special modifications may be required. Special seal materials are available on request.
- > With -M option: -20°F to +185°F (-25°C to +85°C).

How to Specify

Engineering Specifications (ET Models)

Maximum Operating Pressure:	140 psi (10 bar)
Temperature Range:	15° to 160° F (-10° to 70° C)
Expected Service Life:	1,500 miles (with filtered, lubricated air)
Cylinder Lubrication:	PTFE grease

Theoretical Cylinder Forces

FORCE = Power Factor (PF) x Input Pressure

PF x bar = kg; PF x psi = pounds

Bore	Input = PSI		Input = Bar	
	PF Extend	PF Retract	PF Extend	PF Retract
12mm	0.2	0.1	1.1	0.8
16mm	0.3	0.2	2.0	1.5
20mm	0.5	0.4	3.1	2.4
25mm	0.8	0.6	4.9	3.8
32mm	1.2	0.9	8.0	6.0

Tooling Plate Endplay

Maximum Tooling Plate Movement

in Unloaded Condition (values in inches)

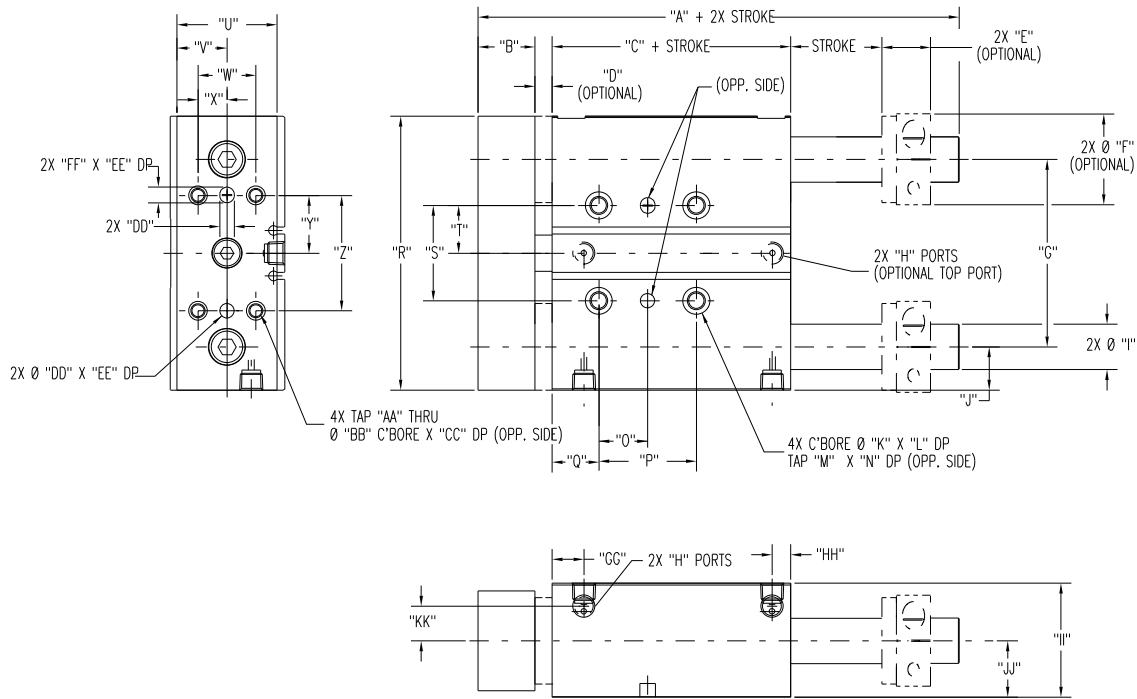
ETS with Standard Bearings											
Bore	25mm	50mm	75mm	100mm	125mm	150mm	175mm	200mm	225mm	250mm	275mm
12mm	0.019	0.031	0.042	0.054	0.066	0.078	0.089	0.101	0.113	0.124	0.136
16mm	0.019	0.031	0.042	0.054	0.066	0.078	0.089	0.101	0.113	0.124	0.136
20mm	0.019	0.030	0.042	0.053	0.064	0.075	0.087	0.098	0.109	0.120	0.132
25mm	0.017	0.026	0.035	0.044	0.053	0.062	0.071	0.080	0.089	0.098	0.107
32mm	0.016	0.024	0.032	0.039	0.047	0.055	0.063	0.070	0.078	0.086	0.094

ETS with Ball Bearings											
Bore	25mm	50mm	75mm	100mm	125mm	150mm	175mm	200mm	225mm	250mm	275mm
12mm	0.006	0.010	0.014	0.018	0.022	0.026	0.030	0.034	0.038	0.042	0.046
16mm	0.006	0.010	0.014	0.018	0.022	0.026	0.030	0.034	0.038	0.042	0.046
20mm	0.007	0.011	0.015	0.019	0.023	0.027	0.031	0.035	0.039	0.043	0.047
25mm	0.005	0.008	0.011	0.014	0.016	0.019	0.022	0.025	0.028	0.031	0.033
32mm	0.006	0.009	0.012	0.015	0.018	0.021	0.024	0.027	0.030	0.033	0.037

ET and ETD with Standard Bearings											
Bore	25mm	50mm	75mm	100mm	125mm	150mm	175mm	200mm	225mm	250mm	275mm
12mm	0.003	0.003	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
16mm	0.003	0.003	0.003	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
20mm	0.003	0.004	0.004	0.004	0.004	0.004	0.005	0.005	0.005	0.005	0.005
25mm	0.003	0.004	0.004	0.004	0.004	0.005	0.005	0.005	0.005	0.005	0.005
32mm	0.004	0.004	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.006	0.006

ET and ETD; with Ball Bearings
Endplay on all ET and ETD Thrusters with Option "X" not to exceed .003"

Dimensions (ET Models)



Bore	A	B	C	D	E	F	G	H	I
12mm	3.20	.55	1.66	.25	0.60	0.95	2.00	#10-32	.39 (10mm)
16mm	3.36	.55	1.81	.25	0.60	0.95	2.00	#10-32	.39 (10mm)
20mm	3.79	.62	1.91	.25	0.68	1.10	2.50	1/8 NPT	.47 (12mm)
25mm	3.90	.79	1.96	.25	0.76	1.34	2.75	1/8 NPT	.63 (16mm)
32mm	4.43	.98	2.21	.25	0.84	1.57	3.25	1/8 NPT	.79 (20mm)

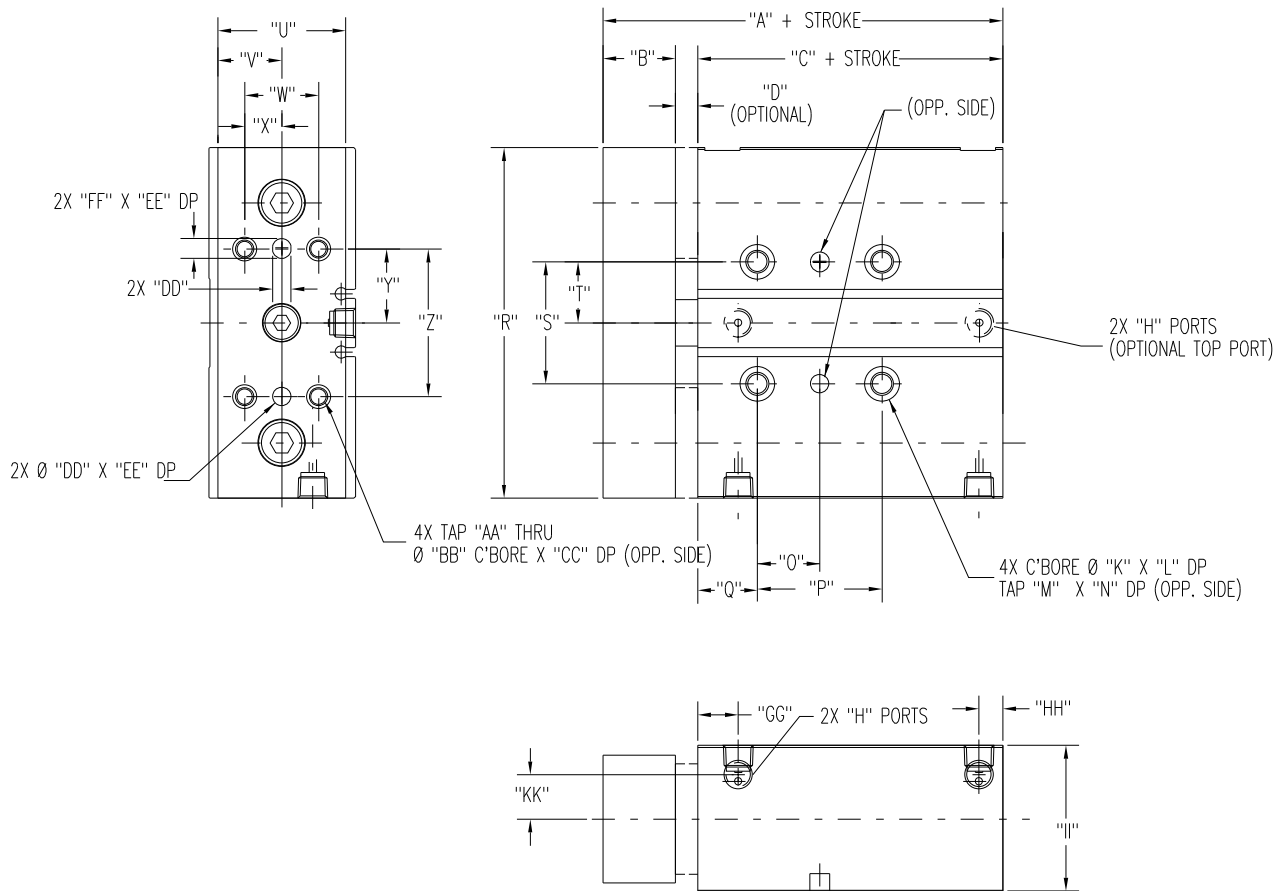
Bore	J	K	L	M	N	O	P	Q	R	S
12mm	.43	.28	.16	#10-32	.50	.44	.88	.63	2.85	1.00
16mm	.43	.28	.16	#10-32	.50	.53	1.06	.65	2.85	1.00
20mm	.50	.38	.21	1/4-20	.63	.63	1.25	.79	3.50	1.39
25mm	.62	.38	.21	1/4-20	.63	.75	1.50	.79	3.99	1.39
32mm	.75	.47	.26	5/16-18	.77	.84	1.69	.85	4.75	1.65

Bore	T	U	V	W	X	Y	Z	AA	BB	CC
12mm	.50	.86	.43	.50	.25	.50	1.00	#8-32	.25	.20
16mm	.50	.86	.43	.63	.31	.63	1.25	#8-32	.25	.20
20mm	.69	1.10	.55	.75	.38	.75	1.50	#10-32	.28	.20
25mm	.69	1.30	.65	.88	.44	.88	1.75	#10-32	.28	.30
32mm	.82	1.73	.87	1.00	.50	1.00	2.00	1/4-20	.33	.44

Bore	DD	EE	FF	GG	HH	II	JJ	KK
12mm	0.1565 / 0.1577	.14	.20	.48	.19	.98	.45	.37
16mm	0.1878 / 0.1890	.20	.24	.51	.19	1.11	.45	.37
20mm	0.1878 / 0.1890	.20	.24	.57	.32	1.36	.57	.49
25mm	0.2503 / 0.2515	.24	.28	.57	.32	1.49	.73	.50
32mm	0.2503 / 0.2515	.24	.28	.63	.32	1.98	.98	.58

How to Specify

Dimensions (ETS Models)



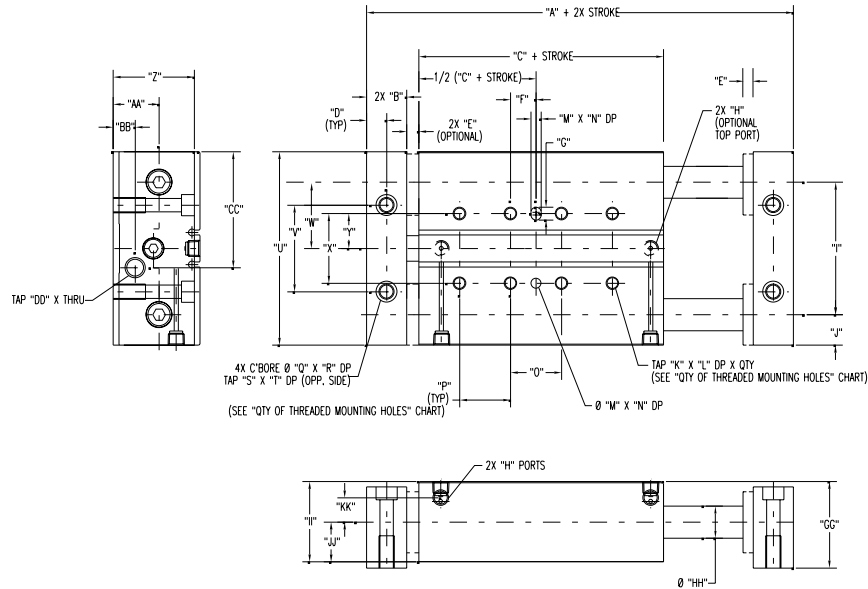
Bore	A*	B	C	D	H	K	L	M	N	O
12mm	2.21	.55	1.66	.25	#10-32	.28	.16	#10-32	.50	.44
16mm	2.36	.55	1.81	.25	#10-32	.28	.16	#10-32	.50	.53
20mm	2.53	.62	1.91	.25	1/8 NPT	.38	.21	1/4-20	.63	.63
25mm	2.75	.79	1.96	.25	1/8 NPT	.38	.21	1/4-20	.63	.75
32mm	3.19	.98	2.21	.25	1/8 NPT	.47	.26	5/16-18	.77	.84

Bore	P	Q	R	S	T	U	V	W	X	Y
12mm	.88	.63	2.85	1.00	.50	.86	.43	.50	.25	.50
16mm	1.06	.65	2.85	1.00	.50	.86	.43	.63	.31	.63
20mm	1.25	.79	3.50	1.39	.69	1.10	.55	.75	.38	.75
25mm	1.50	.79	3.99	1.39	.69	1.30	.65	.88	.44	.88
32mm	1.69	.85	4.75	1.65	.82	1.73	.87	1.00	.50	1.00

Bore	Z	AA	BB	CC	DD	EE	FF	GG	HH	II	KK
12mm	1.00	#8-32	.25	.20	.16	.14	.20	.48	.19	.98	.37
16mm	1.25	#8-32	.25	.20	.19	.20	.24	.51	.19	1.11	.37
20mm	1.50	#10-32	.28	.20	.19	.20	.24	.57	.32	1.36	.49
25mm	1.75	#10-32	.28	.30	.25	.24	.28	.57	.32	1.49	.50
32mm	2.00	1/4-20	.33	.44	.25	.24	.28	.63	.32	1.98	.58

*Optional bumpers (EB) add .25" to overall length

Dimensions (ETD Models)



Bore	A*	B	C	D	E	F	G	H	I	J
12mm	2.76	.55	1.66	.28	0.25	0.44	.20	#10-32	2.00	.43
16mm	2.91	.55	1.81	.28	0.25	0.53	.24	#10-32	2.00	.43
20mm	3.16	.62	1.91	.31	0.25	0.63	.24	1/8 NPT	2.50	.50
25mm	3.54	.79	1.96	.39	0.25	0.75	.28	1/8 NPT	2.75	.62
32mm	4.18	.98	2.21	.49	0.25	0.85	.28	1/8 NPT	3.25	.75

Bore	K	L	M	N	O	P**	Q	R	S	T	U
12mm	#10-32	.50	.1565/.1577	.14	.88	.88	.36	.19	1/4-28	.49	2.85
16mm	#10-32	.50	.1878/.1890	.20	1.06	1.00	.43	.26	5/16-24	.50	2.85
20mm	1/4-20	.63	.1878/.1890	.20	1.25	1.25	.43	.27	5/16-24	.68	3.50
25mm	1/4-20	.63	.2503/.2515	.24	1.50	1.50	.52	.32	3/8-24	.58	3.99
32mm	5/16-18	.77	.2503/.2515	.24	1.69	1.69	.52	.32	3/8-24	.80	4.75

Bore	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF
12mm	1.31	.66	1.00	.50	.84	.56	.28	1.13	M8 x 1.0	.48	.19
16mm	1.26	1.00	1.00	.50	.84	.56	.26	1.16	M8 x 1.0	.51	.19
20mm	1.69	1.25	1.39	.69	1.08	.64	.31	1.31	M10 x 1.0	.57	.32
25mm	1.76	1.38	1.39	.69	1.28	.95	.35	2.41	M12 x 1.0	.57	.32
32mm	2.13	1.63	1.65	.83	1.71	1.12	.41	1.83	M14 x 1.0	.63	.32

Bore	GG	HH	II	JJ	KK
12mm	1.09	.39 (10mm)	.98	.45	.37
16mm	1.22	.39 (10mm)	1.11	.45	.37
20mm	1.43	.47 (12mm)	1.36	.57	.49
25mm	1.70	.63 (16mm)	1.48	.73	.50
32mm	2.12	.79 (20mm)	1.98	.98	.58

How to Specify

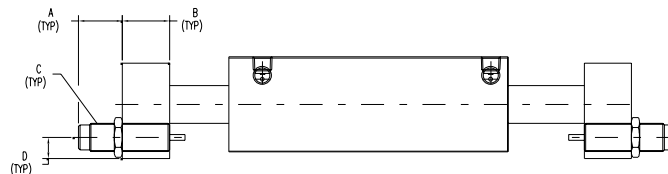
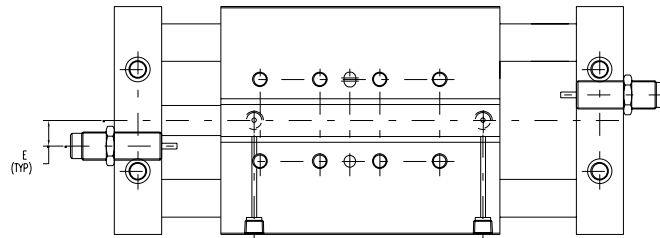
Dimensions (ETD Models)

**Quantity of Threaded Mounting Holes

Bore	4	8	12	16	20	24
	For stroke lengths (mm):					
12mm	13.5 - 57.9	58.0 - 102.3	102.4 - 146.8	146.9 - 191.2	191.3 - 235.7	235.8 - 254.0
16mm	16.0 - 69.6	69.7 - 123.6	123.7 - 177.6	177.7 - 231.6	231.7 - 254.0	N/A
20mm	26.0 - 89.3	89.4 - 152.8	152.9 - 216.3	216.4 - 254.0	N/A	N/A
25mm	31.0 - 107.0	107.1 - 183.2	183.3 - 254.0	N/A	N/A	N/A
32mm	33.0 - 118.6	118.7 - 203.6	203.7 - 254.0	N/A	N/A	N/A

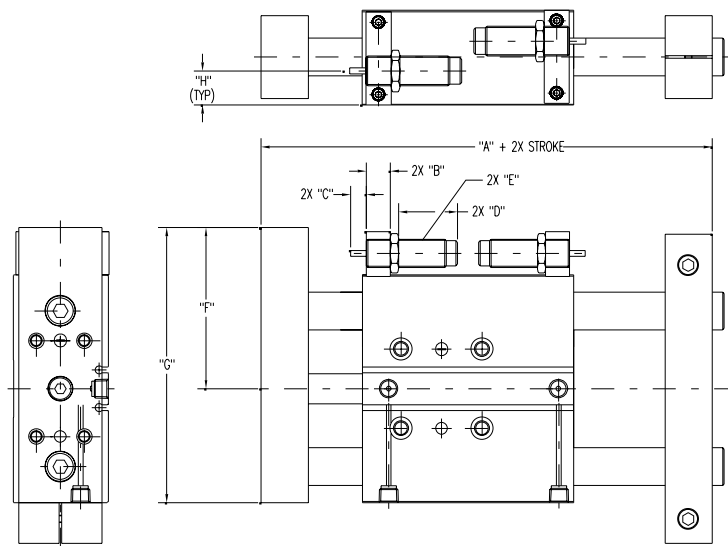
*Optional bumpers (EB, EB1, EB2) add .25" per end to overall length

Option Dimensions - ETD with Shock Absorbers



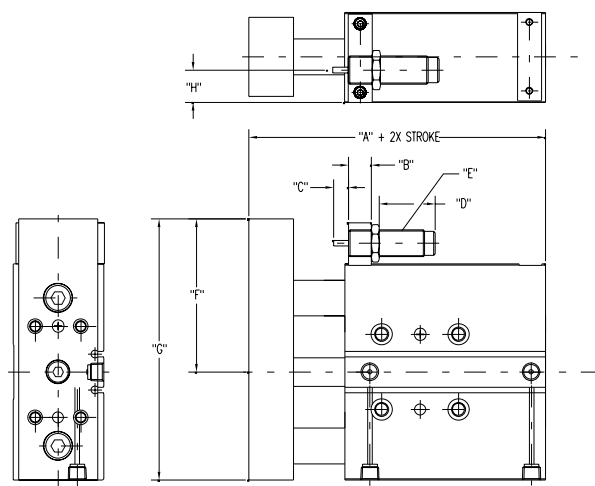
Bore	A	B	C	D	E
12mm	0.57	0.55	M8 x 1.0	0.28	0.30
16mm	0.57	0.55	M8 x 1.0	0.26	0.27
20mm	0.51	0.62	M10 x 1.0	0.31	0.44
25mm	1.17	0.79	M12 x 1.0	0.35	0.42
32mm	2.25	0.99	M14 x 1.0	0.41	0.55

Option Dimensions - ET with Shock Absorbers



Bore	A	B	C	D	E	F	G	H
12mm	3.20	0.23	0.22	0.89	M8 x 1.0	1.91	3.34	0.20
16mm	3.36	0.23	0.22	0.89	M8 x 1.0	1.91	3.34	0.33
20mm	3.79	0.31	0.26	0.82	M10 x 1.0	2.42	4.17	0.79
25mm	3.90	0.39	0.40	1.57	M12 x 1.0	2.71	4.70	0.36
32mm	4.43	0.47	0.63	2.77	M14 x 1.0	3.23	5.60	0.56

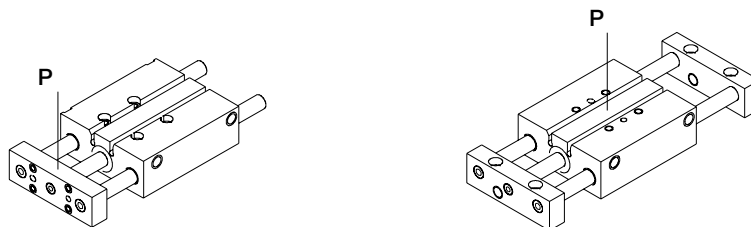
Option Dimensions - ETS with Shock Absorbers



Bore	A	B	C	D	E	F	G	H
12mm	2.46	0.23	0.22	0.89	M8 x 1.0	1.91	3.34	0.20
16mm	2.61	0.23	0.22	0.89	M8 x 1.0	1.91	3.34	0.33
20mm	2.78	0.31	0.26	0.82	M10 x 1.0	2.42	4.17	0.79
25mm	3.00	0.39	0.40	1.57	M12 x 1.0	2.71	4.70	0.36
32mm	3.44	0.47	0.63	2.77	M14 x 1.0	3.23	5.60	0.56

How to Specify

Maximum Side Load



Maximum Load “P” as shown for ET, ETS, ETD with Standard Bearings (pounds)

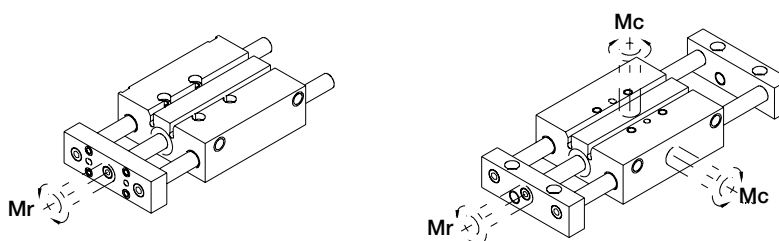
Bore	ET	ETD	ETS; by Stroke										
			25mm	50mm	75mm	100mm	125mm	150mm	175mm	200mm	225mm	250mm	275mm
12mm	19	64	3.5	2.2	1.6	1.3	1.0	0.9	0.8	0.7	0.6	0.6	0.5
16mm	19	64	3.5	2.2	1.6	1.3	1.0	0.9	0.8	0.7	0.6	0.6	0.5
20mm	26	92	5.6	3.7	2.8	2.2	1.8	1.6	1.4	1.2	1.1	1.0	0.9
25mm	43	156	11.1	7.5	5.7	4.6	3.8	3.3	2.9	2.6	2.3	2.1	1.9
32mm	68	255	21.5	15.0	11.6	9.4	7.9	6.8	6.0	5.4	4.9	4.4	4.1

Maximum Load “P” as shown for ET, ETS, ETD with Ball Bearings, Option “X” (pounds).
For Ball Bearing mode, use 2x load rating for standard bearings in above table.

Maximum Moments

Maximum Radial Moment (Mr) as shown for ET, ETS, ETD Standard Bearings (inch-pounds)

Standard Bearings		
Bore	ET/ETD	ETS
12mm	64	32
16mm	64	32
20mm	115	57
25mm	214	107
32mm	414	207



For Ball Bearing model, use 2x Moment Rating
for Standard Bearings in above table.

Maximum Axial (Ma) and Cross (Mc) Moments as shown for ETD Standard Bearings (inch-pounds)

ETD by Stroke											
Bore	25mm	50mm	75mm	100mm	125mm	150mm	175mm	200mm	225mm	250mm	275mm
12mm	72	104	136	168	200	232	264	296	328	360	392
16mm	77	109	141	173	205	237	269	301	332	365	370
20mm	112	158	203	250	295	341	387	433	478	525	570
25mm	184	262	340	417	495	573	650	729	806	885	960
32mm	309	437	564	690	819	947	1074	1200	1329	1457	1584

For Ball Bearing model, use 2x Moment Rating for Standard Bearings in above table.

The model number of the Extruded Linear Thruster consists of three alphanumeric clusters designating product type, bore size, stroke lengths, and other optional components that together make up the complete part number to use in ordering. Use the ordering information below to build a valid part number. **Please note that the following features are standard, and are included in all model numbers: E (inch series threading) and M (magnetic position sensing).**

An example of a basic ET unit with 16mm bore, 100mm stroke, inch series porting/mounting, medium duty shock absorbers on both ends, and magnetic position sensing.

Model		Bore Size	
ET	Extended Shafts (four bushings)	12	12mm
ETS	Shafts Flush (two bushings)	16	16mm
ETD	Double End (saddle mount)	20	20mm
		25	25mm
		32	32mm

ET - 16100 - EK12M

Standard Stroke Lengths (1mm increments to 255mm)				
Bore	ETD	ET with Option X (Ball Bearings)	ET with Option K (Shock Absorbers)	ETD with Option X Only two bushings (not four) when stroke is less than:
12mm	13.5mm	26mm	N/A	26mm
16mm	16mm	26mm	N/A	26mm
20mm	26mm	26mm	N/A	26mm
25mm	31mm	39mm	16mm	39mm
32mm	33mm	42mm	45mm	42mm

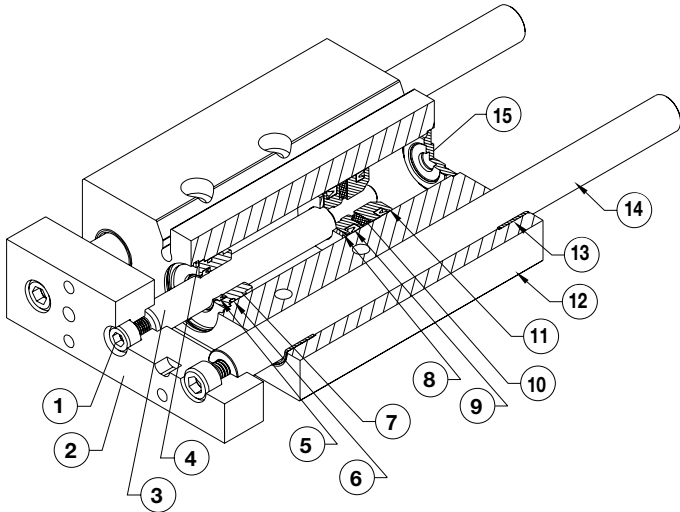
Options (U.S. Customary Units)	
E	Inch Series Porting/Mounting ¹
EB	External Bumpers, Retract ²
EB1	External Bumpers, Extend ^{2,3}
EB2	External Bumpers, Both Ends ^{2,3}
K _ _	1 (Both Ends)
	First _ will be 2 (Extend Only)
	3 (Retract Only) ⁴
	1 (Light Duty)
Second _ will be	2 (Medium Duty)
	3 (Heavy Duty) ⁵
M	MRS Position Sensing ¹
P	Ports on Top Surface ⁶
V	High Temperature Fluoroelastomer Seals (0°-275° F)
X	Ball Bushings and Hardened Shafts ⁷

- ¹ Standard; included on all model numbers
² No stroke reduction with bumpers; extend bumpers include one set of collars
³ Not available on ETS models
⁴ ETS models must choose K3 (retract only)
⁵ Not available on 12mm and 16mm bores
⁶ Must be specified if Option X is ordered
⁷ Must be specified if Option P is ordered

How to Repair

Bimba Linear Thrusters are repairable. A list of the individual components is given below that together make up Bimba Linear Thrusters. For questions or more information, contact Bimba Customer Service at 800-442-4622 (800-44-BIMBA) or e-mail cs@bimba.com.

Repair Parts (Extruded Thrusters)



Item #	Description
1	Assembly Bolt
2	Tooling Plate
3	Piston Rod
4	Retaining Ring
5	Rod Seal
6	Rod Guide Seal
7	Rod Guide
8	Bumper
9	Piston Seal
10	Magnet
11	Piston
12	Body
13	Guide Bushing
14	Guide Shaft
15	Rear Head

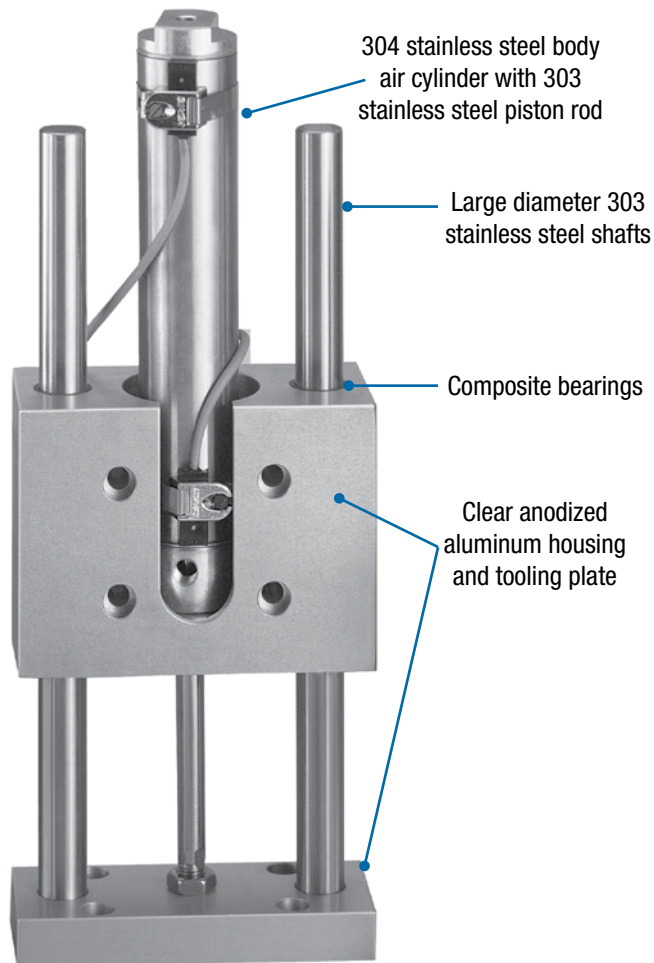
Repair Kits (Extruded Thrusters)

The basic repair kit includes: piston seals, a rod seal, and a rod guide seal. Specify as K-B-ET- (bore size) - V (if applicable).

Kit	Description
K-B-ET-[BORE]	Basic repair kit
K-B-ET-[BORE]-V	Basic repair kit (high temperature)

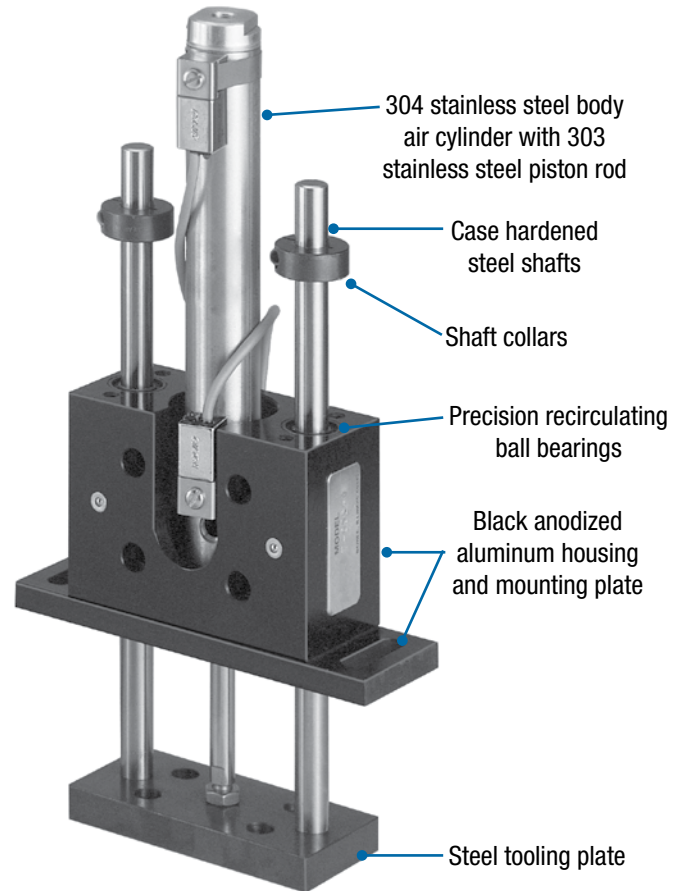
All product is sold F.O.B. shipping point. Prices are subject to change without notice.

T and TE Series Linear Thrusters



TE Series

- > Large diameter stainless steel shafts (hard chrome-plated carbon steel on 2-1/2" and 3" bores).
- > Mounting plate and shaft collars optional.
- > High-strength composite bearing made of fiber-imbedded plastic.
- > Composite bearing may perform better in certain environments (for example, dust or lint).
- > Composite bearing/stainless steel shaft combination is ideal for corrosive environments.
- > High load capabilities.



T Series

- > Less friction
- > High precision
- > Easily accessible lubrication ports
- > Mounting plate and shaft collars standard

Advantages

- > Bimba stainless steel body air cylinders for long, reliable life.
- > Optional magnetic piston for use with Hall Effect or Magnetic Reed Switches. (Hall Effect Switch not available for 9/16" bore.)
- > Optional adjustable cushions for smooth deceleration of load at end of stroke. (Not available for 9/16".)
- > Optional internal or external bumpers to absorb shock or adjust stroke.
- > Easily accessible ports.
- > Choice of TE (composite bearing) and T (ball bearing).

How it Works

Engineering Data (T-Series Models)

Components:

- > Case hardened steel shafts
- > Steel tooling plate and collars
- > Black anodized aluminum housing and mounting plate
- > Precision recirculating ball bearings

Cylinder:

- > 304 stainless steel body
- > High-strength aluminum alloy porting ends
- > 303 stainless steel piston rods
- > Buna N "U" cup seals
- > Sintered bronze rod guide bushing

Options:

- > Internal Buna N or external urethane bumpers
- > Patented adjustable cushions*
- > Buna N magnet for position sensing

Lubrication:

- > The two spring-loaded oiler ports on the housing face should receive several drops of medium to heavy inhibited hydraulic or general purpose oil every 100 hours of operation. For applications that involve rapid cycling, oil these ports more often.

Engineering Data (Multiple Position Models)

Components:

- > Case hardened or hard chrome plated carbon steel shafts
- > Steel or clear anodized aluminum tooling plate and collars
- > Precision recirculating ball bearings or plastic composite

Cylinder:

- > 304 stainless steel body
- > High-strength aluminum alloy porting ends
- > 303 stainless steel piston rods
- > Buna N "U" cup seals
- > Sintered bronze rod guide bushing

Options:

- > Internal Buna N or external urethane bumpers
- > Buna N magnet for position sensing

Lubrication:

- > Air cylinders are pre-lubricated and sealed at the factory for extensive maintenance-free life. Cylinder life can be lengthened by providing additional lubricant with an air line mist lubricator or direct introduction of oil to the cylinder every 500 hours of operation. Recommended oil is medium to heavy inhibited hydraulic and general purpose oil.
- > The two spring-loaded oiler ports on the housing face should also receive several drops of the same oil every 100 hours of operation. For applications that involve rapid cycling, oil these ports more often.
- > T-700 series incorporates grease fittings.

Engineering Data (T4 Models)

Components:

- > Case hardened steel shafts
- > Steel tooling plate and collars
- > Black anodized aluminum housing and mounting plate
- > Precision recirculating ball bearings

Cylinder:

- > 304 stainless steel body
- > High-strength aluminum alloy porting ends
- > 303 stainless steel piston rods
- > Buna N "U" cup seals
- > Sintered bronze rod guide bushing

Options:

- > Internal Buna N or external urethane bumpers
- > Patented adjustable cushions
- > Buna N magnet for position sensing

Lubrication:

- > Air cylinders are pre-lubricated and sealed at the factory for extensive maintenance-free life. Cylinder life can be lengthened by providing additional lubricant with an air line mist lubricator or direct introduction of oil to the cylinder every 500 hours of operation. Recommended oils are medium to heavy inhibited hydraulic and general purpose oil.
- > The two spring-loaded oiler ports on the housing face should also receive several drops of the same oil every 100 hours of operation. For applications that involve rapid cycling, oil these ports more often.

Approximate Weights (T4 Models)

Bore	Base Weight (lbs.)	Adder per 1" (lbs.)
2" (31)	24	0.67
2-1/2" (50)	41	1.16
3" (70)	82.5	1.82

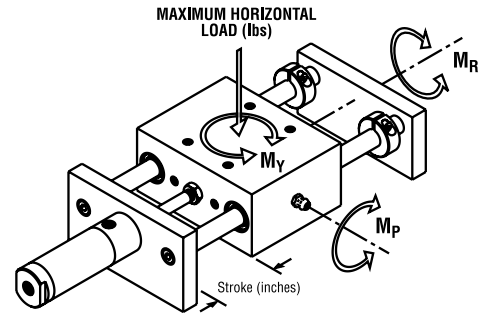
Engineering Data (Movable Housing Models)

Horizontal and Torsional Load Capacities

The following charts and tables provide loading and deflection data to assist in the sizing of Movable Housing Linear Thrusters. The Capacity tables provide the maximum loading for the thrusters under dynamic and static conditions. The dynamic capacities are presented as a function of travel life stated in millions of linear inches. As shown by the tables, the travel life is a function of load. Therefore, higher dynamic loads can be applied but will reduce travel life.

The deflection curves shown reflect the theoretical deflections of the guide shafts at mid-stroke.

Example: The 02 bore has a maximum dynamic load capacity of 45 lbs. for a travel life of 200 million inches.



Horizontal Load Capacity

Bore	Max Dynamic Load (lbs)				Max Static Load (lbs)
	Travel Life (x 10 ⁶ inches)				
	50	200	500	1000	
02	71	45	32	26	87
04/09	209	131	96	76	256
17	328	231	169	133	328
31/50	403	259	190	150	403
70	938	579	419	326	1062

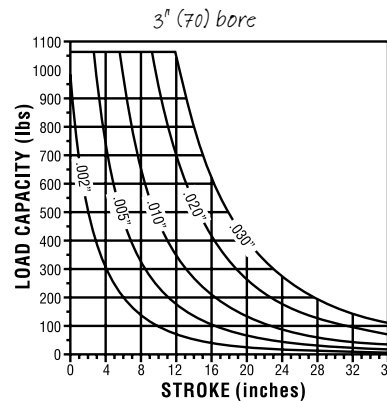
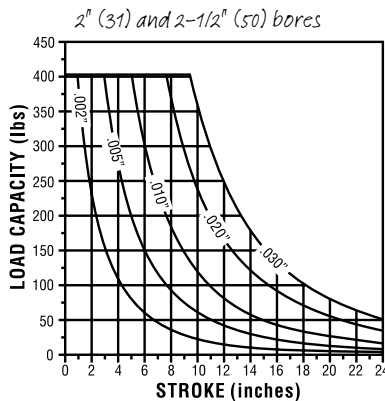
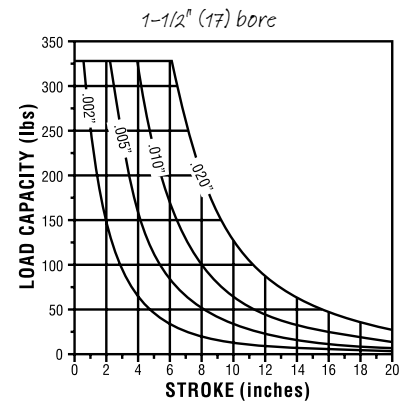
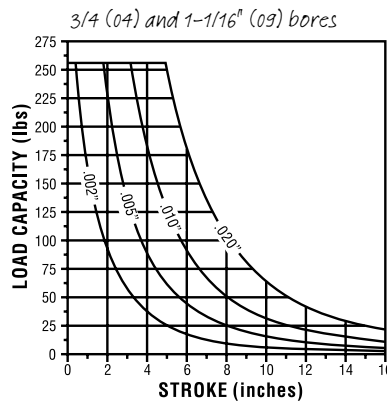
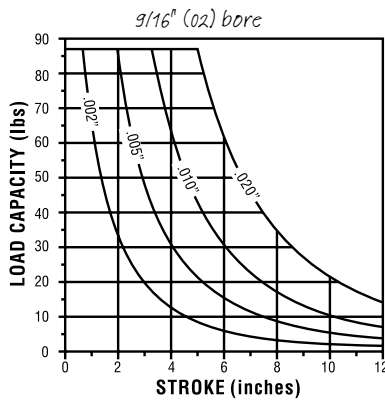
Torque Capacity - M_R

Bore	Max Dynamic Torque (in-lbs)				Max Static Torque (in-lbs)
	Travel Life (x 10 ⁶ inches)				
	50	200	500	1000	
02	68	43	32	25	82
04/09	159	100	74	59	193
17	372	267	196	156	372
31/50	430	279	205	163	430
70	1756	1106	815	647	1952

Torque Capacity - M_P and M_Y

Bore	Max Dynamic Torque (in-lbs)				Max Static Torque (in-lbs)
	Travel Life (x 10 ⁶ inches)				
	50	200	500	1000	
02	77	48	36	28	93
04/09	331	209	154	122	403
17	662	474	349	277	662
31/50	1012	655	483	383	1012
70	3875	2441	1798	1427	4308

Horizontal Load and Deflection Charts

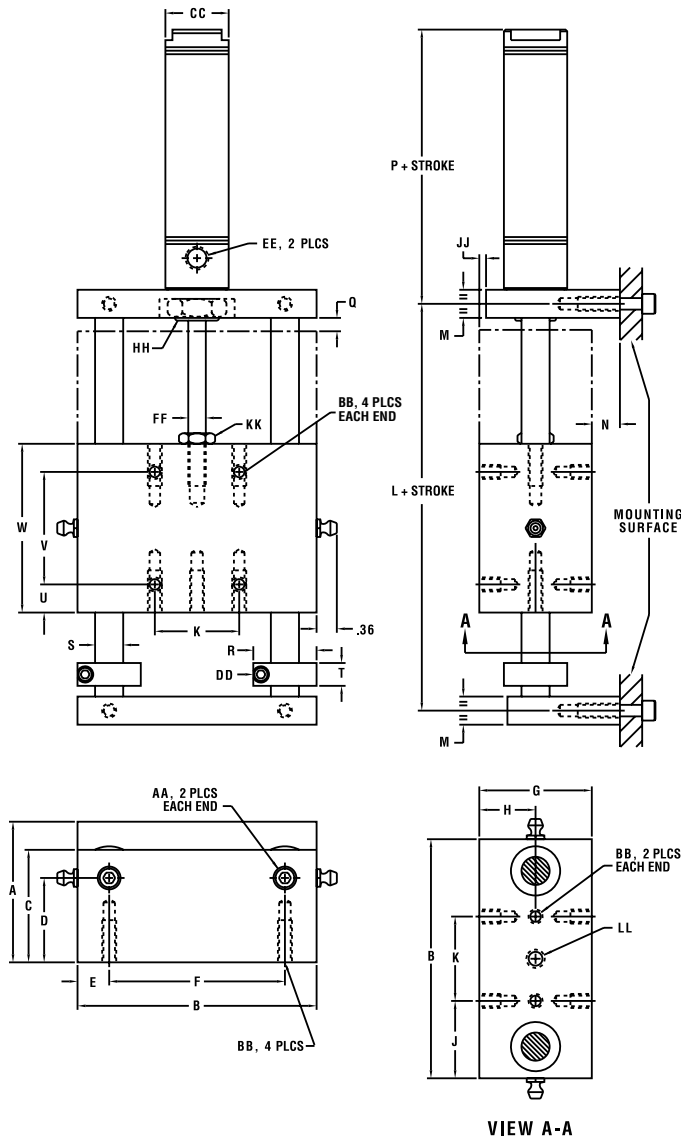


Approximate Weights

Bore	Base (lbs)	Adder per inch of stroke
02	1.8	0.10
04/09	3.6	0.20
17	8.5	0.29
31/50	12.5	0.42
70	47.5	1.12

How to Specify

Dimensions (Movable Housing Models)



NOTE: All dimensions are in inches.

Bore	9/16"	3/4"	1-1/16"	1-1/2"	2"	2-1/2"	3"
A	1.50	2.50	2.50	3.00	3.50	4.00	5.002
B	3.00	4.25	4.25	5.50	7.00	8.50	11.00
C	1.25	2.00	2.00	2.50	3.00	3.50	4.00
D	0.87	1.50	1.50	1.75	2.00	2.25	2.75
E	0.44	0.56	0.56	0.75	1.00	1.125	1.50
F	2.125	3.125	3.125	4.00	5.00	6.25	8.00
G	1.25	2.00	2.00	2.50	3.00	3.50	4.00
H	0.62	1.00	1.00	1.25	1.50	1.75	2.00
J	1.00	1.38	1.38	1.75	2.00	2.50	3.50
K	1.00	1.50	1.50	2.00	3.00	3.50	4.00
L	4.38	4.63	4.63	6.00	6.50	8.50	11.00
M	0.38	0.50	0.50	0.75	0.75	1.00	1.00
N	0.25	0.50	0.50	0.50	0.50	0.50	0.75
P	2.10	2.72	2.88	3.19	3.88	4.00	4.38
Q	0.21	0.21	0.21	0.38	0.911	0.581	0.51
R	0.87	1.12	1.12	1.31	1.50	1.75	2.06
S	0.375	0.50	0.50	0.625	0.75	1.00	1.25
T	0.34	0.41	0.41	0.44	0.50	0.50	0.50
U	0.50	0.50	0.50	0.75	0.75	1.00	1.00
V	2.00	2.00	2.00	2.50	2.50	4.00	5.00
W	3.00	3.00	3.00	4.00	4.00	6.00	7.00
AA	10-32	1/4-20	1/4-20	3/8-16	3/8-16	1/2-13	1/2-13
BB	10-32	1/4-20	1/4-20	5/16-18	3/8-16	7/16-14	1/2-13
CC	0.62	0.81	1.12	1.56	2.08	2.62	3.16
DD	6-32	8-32	8-32	10-32	1/4-28	1/4-28	1/4-28
EE	10-32	1/8 NPT	1/8 NPT	1/8 NPT	1/4 NPT	1/4 NPT	3/8 NPT
FF	0.188	0.25	0.312	0.437	0.625	0.625	0.75
HH	7/16-20	5/8-18	5/8-18	3/4-16	1-1/4-12	1-3/8-12	1-1/2-12
JJ	0.06	0.12	0.12	0.12	0.12	0.12	-
KK	10-32	1/4-28	5/16-24	7/16-20	1/2-20	1/2-20	5/8-18
LL	1/4-28	5/16-24	1/4-28	1/2-20	5/8-18	5/8-18	1-14

NOTES:

Dimension Q = 0.70 inches for strokes longer than 6 inches.

Dimension shown is to top of cylinder end mounting plate.

Dimension to top of housing is 4.75 inches.

Dimensional Notes:

- > Cylinder options Q, C, B will increase the overall length of the cylinder. Dimension P will grow (see charts below).
- > When specifying Position Feedback (TMHF or TEMHF), or the Bimba 500 Cylinder (option H), dimension P will increase and the stroke will be reduced.

Contact 1-800-44-BIMBA for dimensional information.

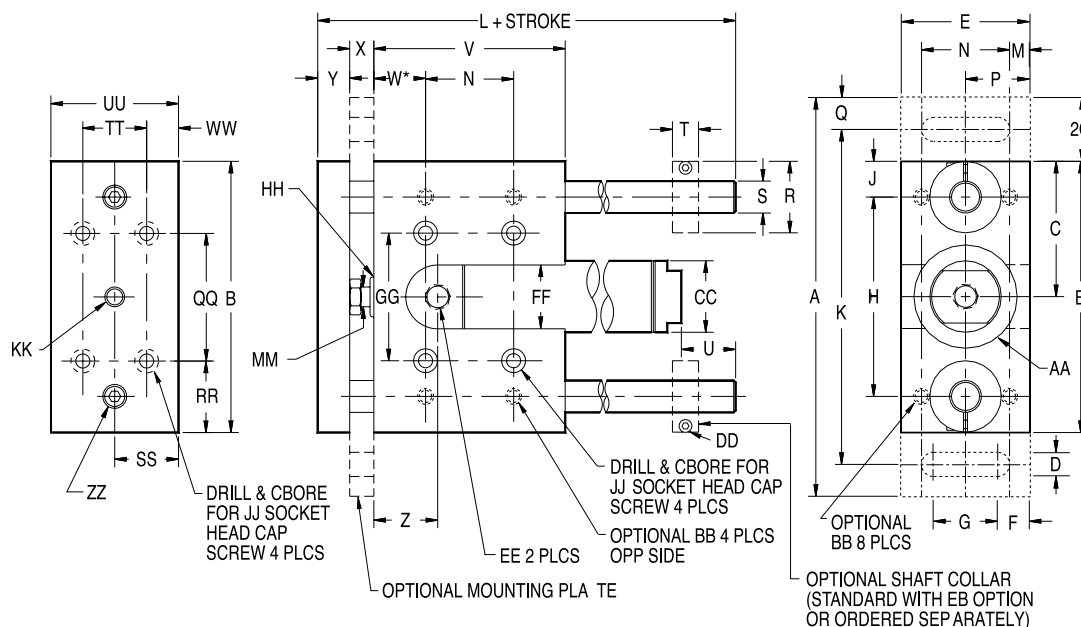
P Dimension Length Adders

Bore	9/16"	3/4"	1-1/16"	1-1/2"	2"	2-1/2"	3"
B-Option	0.13	--	0.13	0.13	0.25	0.25	0.25
C-Option	N/A	0.43	0.25	0.18	0.38	0.38	0.44
Q-Option	0.03	0.44	0.25	0.19	0.38	0.38	0.44
Z-Option	N/A	N/A	0.35	0.25	0.34	N/A	N/A
PFC-Option	N/A	N/A	0.90	0.94	0.85	1.41	1.22

Q Dimension Length Adders

Bore	9/16"	3/4"	1-1/16"	1-1/2"	2"	2-1/2"	3"
Z-Option	N/A	N/A	0.57	0.40	0.30	N/A	N/A
PFC-Option	N/A	N/A	0.48	0.12	0.05	0.17	0.43

Dimensions (TE Models)



Bore	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
9/16" (02)	3.50	2.50	1.25	0.22	1.00	0.31	0.38	1.75	0.38	3.00	3.50	0.12	0.75	0.50	0.25
3/4" (04)	4.50	3.00	1.50	0.25	1.25	0.38	0.50	2.12	0.44	3.75	4.25	0.16	0.94	0.62	0.38
1-1/16" (09)	6.25	4.25	2.12	0.38	2.00	0.50	1.00	3.12	0.56	5.25	5.00	0.31	1.38	1.00	0.50
1-1/2" (17)	7.50	5.50	2.75	0.44	2.50	0.59	1.31	4.00	0.75	6.50	6.38	0.38	1.75	1.25	0.50
2" (31)	8.00	6.00	3.00	0.44	3.00	0.75	1.50	4.25	0.88	7.00	7.12	0.50	2.00	1.50	0.50
2-1/2" (50)	11.50	7.50	3.75	0.69	3.50	0.84	1.81	5.37	1.06	9.50	9.75	0.50	2.50	1.75	1.00
3" (70)	13.00	9.00	4.50	0.81	4.50	1.15	2.19	6.50	1.25	11.00	11.50	0.75	3.00	2.25	1.00

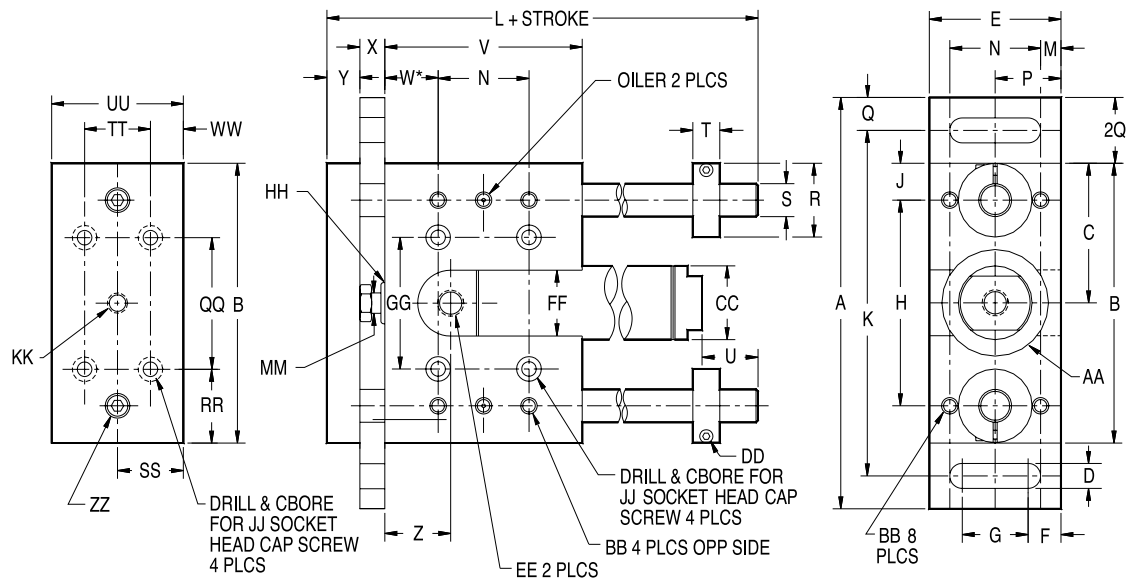
Bore	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE
9/16" (02)	0.88	0.38	0.34	0.60	2.25	1.25	0.25	0.38	0.86	0.75	8-32	0.62	6-32	10-32
3/4" (04)	1.12	0.50	0.41	0.52	2.50	0.78	0.38	0.50	0.85	1.00	10-32	0.81	8-32	1/8 NPT
1-1/16" (09)	1.31	0.62	0.44	0.98	3.00	0.81	0.38	0.62	1.00	1.50	1/4-20	1.12	10-32	1/8 NPT
1-1/2" (17)	1.50	0.75	0.50	1.57	4.00	1.12	0.50	0.75	1.38	2.00	5/16-18	1.56	1/4-28	1/8 NPT
2" (31)	1.62	0.88	0.50	1.07	4.00	1.00	0.75	1.00	1.60	2.25	5/16-18	2.08	1/4-28	1/4 NPT
2-1/2" (50)	1.87	1.13	0.50	2.20	6.00	1.75	0.75	1.25	1.45	3.00	3/8-16	2.62	1/4-28	1/4 NPT
3" (70)	2.25	1.38	0.56	3.73	7.00	2.00	1.00	1.50	1.62	3.50	1/2-13	3.12	1/4-28	3/8 NPT

Bore	FF	GG	HH	JJ	KK	MM	QQ	RR	SS	TT	UU	WW	ZZ
9/16" (02)	0.69	1.00	7/16-20	#8	10-32	0.19	1.25	0.63	0.45	0.60	0.90	0.15	#10-32
3/4" (04)	0.94	1.25	5/8-18	#10	1/4-28	0.25	1.50	0.75	0.58	0.75	1.15	0.20	1/4-20
1-1/16" (09)	1.12	1.88	5/8-18	1/4	5/16-24	0.31	2.00	1.12	0.88	1.00	1.75	0.38	5/16-18
1-1/2" (17)	1.12	2.38	3/4-16	5/16	7/16-20	0.44	3.00	1.25	1.12	1.50	2.25	0.38	3/8-16
2" (31)	1.25	2.70	1-1/4-12	5/16	1/2-20	0.62	3.00	1.50	1.38	2.00	2.75	0.38	3/8-16
2-1/2" (50)	1.50	3.50	1-3/8-12	3/8	1/2-20	0.63	3.75	1.88	1.63	2.25	3.25	0.50	1/2-13
3" (70)	1.75	4.20	1-1/2-12	1/2	5/8-18	0.75	4.50	2.25	2.00	2.75	4.00	0.63	3/4-16

NOTES:
 9/16" (02) model: Drawing is not an accurate depiction.
 Linear Thrusters ordered with adjustable cushions incorporate a side port on rear of cylinder.
 Linear Thrusters ordered with PFC Technology (model TEF) include a sideported, extended rearhead.
 Dimension X will also grow as much as 3/16". Contact Technical Assistance for details.

How to Specify

Dimensions (T Models)



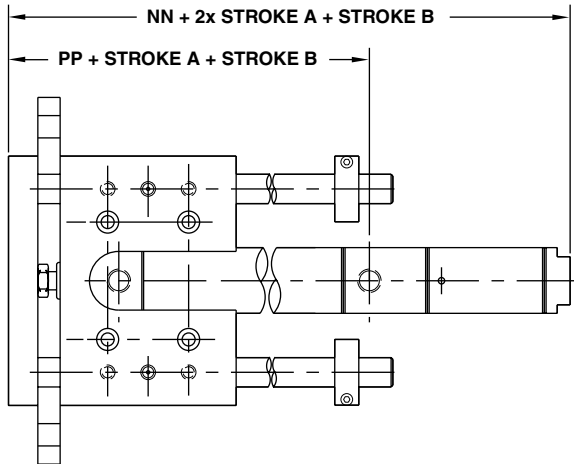
Bore	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R
9/16" (02)	3.50	2.50	1.25	0.22	1.00	0.31	0.38	1.75	0.38	3.00	3.50	0.12	0.75	0.50	0.25	0.62
3/4" (04)	4.50	3.00	1.50	0.25	1.25	0.38	0.50	2.12	0.44	3.75	4.12	0.16	0.94	0.62	0.38	0.88
1-1/16" (09)	6.25	4.25	2.12	0.38	2.00	0.50	1.00	3.12	0.56	5.25	4.75	0.31	1.38	1.00	0.50	1.12
1-1/2" (17)	7.50	5.50	2.75	0.44	2.50	0.59	1.31	4.00	0.75	6.50	6.25	0.38	1.75	1.25	0.50	1.31
2" (31)	9.50	7.00	3.50	0.56	4.00	1.22	1.56	5.00	1.00	8.25	7.00	0.94	2.12	2.00	0.63	1.50
2-1/2" (50)	12.50	8.50	4.25	0.63	4.50	1.25	2.00	6.25	1.13	10.50	9.50	0.94	2.63	2.25	1.00	1.75
3" (70)	15.00	11.00	5.50	0.81	6.00	1.41	3.19	8.00	1.50	13.00	11.50	1.00	4.00	3.00	1.00	2.06

Bore	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF
9/16" (02)	0.25	0.28	0.67	2.25	1.25	0.25	0.31	0.86	0.75	8-32	0.62	4-40	10-32	0.69
3/4" (04)	0.38	0.34	0.51	2.50	0.78	0.38	0.38	0.85	0.94	10-32	0.81	6-32	1/8 NPT	0.94
1-1/16" (09)	0.50	0.41	0.85	3.00	0.81	0.38	0.50	1.00	1.62	1/4-20	1.12	8-32	1/8 NPT	1.12
1-1/2" (17)	0.62	0.44	1.44	4.00	1.12	0.50	0.75	1.50	2.12	5/16-18	1.56	10-32	1/8 NPT	1.12
2" (31)	0.75	0.50	0.95	4.00	0.94	0.75	1.00	1.60	3.00	3/8-16	2.08	1/4-28	1/4 NPT	1.25
2-1/2" (50)	1.00	0.50	2.92	6.00	1.69	0.75	1.25	1.48	3.50	3/8-16	2.62	1/4-28	1/4 NPT	1.25
3" (70)	1.25	0.50	3.75	7.00	1.50	1.00	1.50	1.88	4.63	1/2-13	3.12	1/4-28	3/8 NPT	1.25

Bore	GG	HH	JJ	KK	MM	QQ	RR	SS	TT	UU	WW	ZZ
9/16" (02)	1.00	7/16-20	#8	10-32	0.19	1.25	0.62	0.50	0.60	1.00	0.20	N/A
3/4" (04)	1.25	5/8-18	#10	1/4-28	0.25	1.50	0.75	0.62	0.75	1.25	0.25	10-32
1-1/16" (09)	1.88	5/8-18	1/4	5/16-24	0.31	2.00	1.12	1.00	1.00	2.00	0.50	1/4-20
1-1/2" (17)	2.38	3/4-16	5/16	7/16-20	0.437	3.00	1.25	1.25	1.50	2.50	0.50	3/8-16
2" (31)	3.25	1-1/4-12	3/8	1/2-20	0.625	4.00	1.50	1.50	2.00	3.00	0.50	3/8-16
2-1/2" (50)	4.10	1-3/8-12	3/8	1/2-20	0.63	4.75	1.76	2.00	3.00	4.00	0.50	1/2-13
3" (70)	5.25	1-1/2-12	1/2	5/8-18	0.75	6.00	2.50	2.00	3.00	4.00	0.50	3/4-16

NOTES:
 9/16" (02) model: Drawing is not an accurate depiction.
 Linear Thrusters ordered with adjustable cushions incorporate a side port on rear of cylinder.
 Linear Thrusters ordered with PFC Technology (model TEF) include a sideported, extended rearhead.
 Dimension X will also grow as much as 3/16". Contact Technical Assistance for details.

Dimensions (Multiple Position Thruster Models)

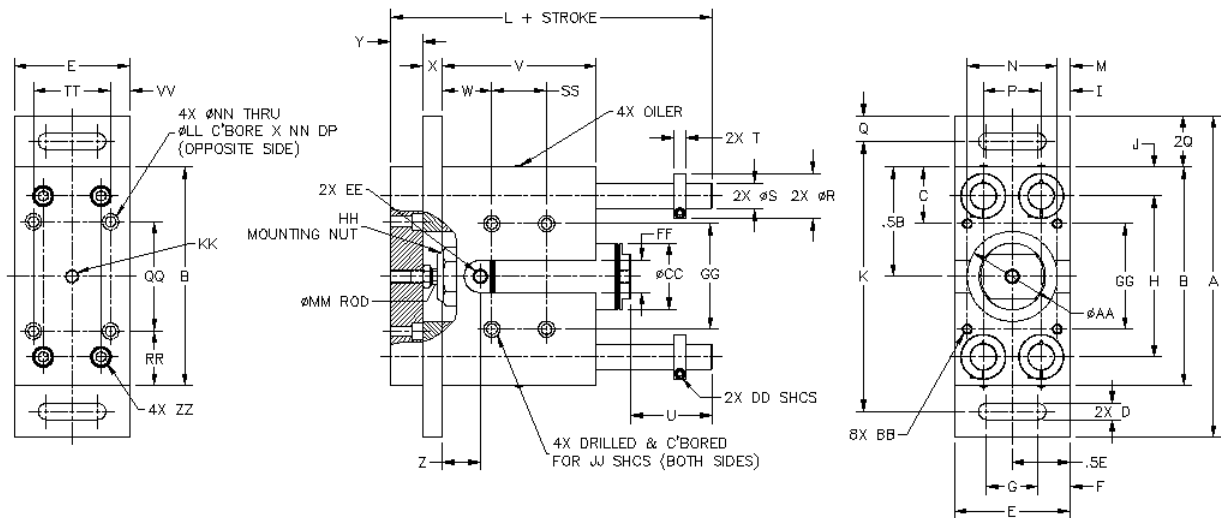


(T Series shown)

Bore Size	NN	PP
9/16" (02)	4.67	2.80
3/4" (04)	6.11	3.76
1-1/16" (09)	6.62	3.90
1-1/2" (17)	7.62	4.81
2" (31)	9.61	6.14

NOTE: Additional T and TE dimensions can be found on pages 307 and 308.

Dimensions (T4 Models)



Bore	A	B	C	D	E	F	G	H	I	J	K	L	M	N	P	Q	R
2" (31)	9.50	7.00	1.75	0.56	4.00	1.22	1.56	5.25	1.00	0.88	8.25	7.00	0.63	2.75	2.00	0.63	1.50
2-1/2" (50)	12.50	8.50	2.20	0.63	4.50	1.25	2.00	6.25	1.13	1.13	10.50	9.50	0.50	3.50	2.25	1.00	1.75
3" (70)	15.00	11.00	2.88	0.81	6.00	1.41	3.19	8.00	1.50	1.50	13.00	11.50	0.50	5.00	3.00	1.00	2.06

Bore	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF	GG	HH
2" (31)	0.75	0.50	0.95	4.00	1.25	0.75	1.00	1.53	3.00	3/8-16	2.08	1/4-28	1/4 NPT	1.25	3.50	1-1/4-12
2-1/2" (50)	1.00	0.50	3.17	6.00	1.94	0.75	1.25	1.49	3.50	3/8-16	2.62	1/4-28	1/4 NPT	1.25	4.10	1-3/8-12
3" (70)	1.25	0.50	3.87	7.00	1.75	1.00	1.50	1.97	4.63	1/2-13	3.12	1/4-28	3/8 NPT	1.25	5.25	1-3/8-12

Bore	JJ	KK	LL	MM	NN	QQ	RR	SS	TT	UU	VV	ZZ
2" (31)	3/8	1/2-20	0.63	0.63	0.41	3.50	1.75	1.50	3.00	10.00	0.50	3/8-16 SHCS
2-1/2" (50)	3/8	1/2-20	0.63	0.63	0.41	4.25	2.13	2.13	3.00	12.25	0.75	1/2-13 SHCS
3" (70)	1/2	5/8-18	0.81	0.75	0.53	5.50	2.75	3.50	4.50	15.00	0.75	3/4-16 Hex Bolt

Linear Thrusters ordered with adjustable cushions incorporate a side port on rear of cylinder.

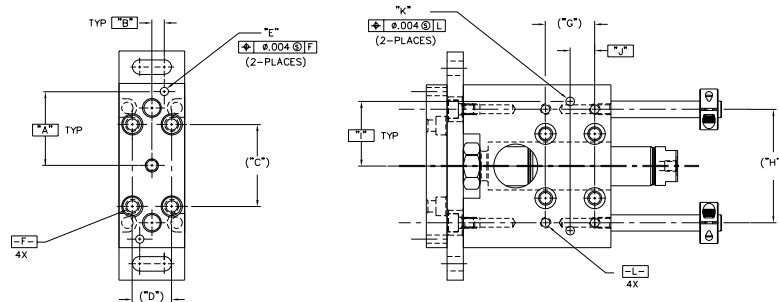
How to Specify

Approximate Weights (T and TE Series)

Bore	Base Weight (oz.)	Adder per 1" (oz.)	Mounting Plate (oz.)
9/16" (02)	13	1	1
3/4" (04)	32	2.2	2.2
1-1/16" (09)	46	5.7	5
1-1/2" (17)	154	6.3	10
2" (31)	296	8.3	32
Model T			
2-1/2" (50)	586	9.9	191
3" (70)	1048	15.2	408
Model TE			
2-1/2" (50)	400	11.7	137
3" (70)	640	17.6	265

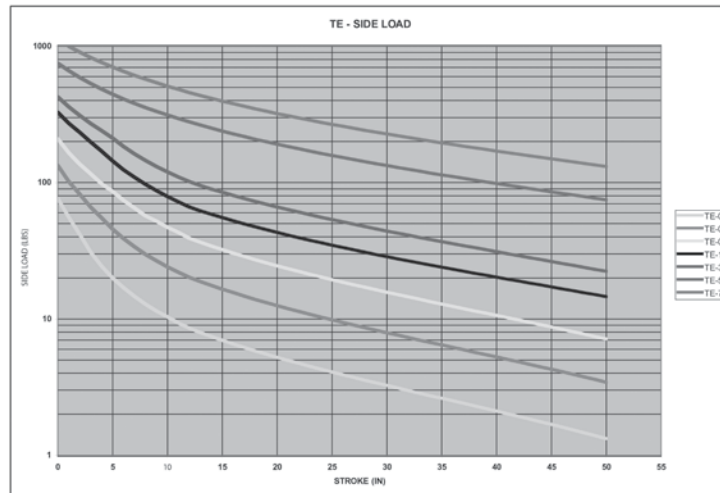
Transition Plates

Dowel Pin Hole Locations



Bore	A	B	C	D	E	G	H	I	J	K
020 (9/16")	1.125	.188	1.250	.600	.1270/.1280 THRU.	.750	1.750	.8750	.375	.1270/.1280 x .240/.260 DP.
040 (3/4")	1.313	.250	1.500	.750	.1895/.1905 THRU.	.938	2.125	1.1250	.469	.1895/.1905 x .290/.310 DP.
090 (1-1/16")	1.813	.375	2.000	1.000	.2520/.2530 THRU.	1.375	3.125	1.5625	.688	.2520/.2530 x .410/.430 DP.
170 (1-1/2")	2.375	.500	3.000	1.500	.3145/.3155 THRU.	1.750	4.000	2.0000	.875	.3145/.3155 x .560/.580 DP.
310 (2")	3.000	.625	4.000	2.000	.3770/.3780 THRU.	2.125	5.000	2.5000	1.063	.3770/.3780 x .810/.830 DP.
310 (2") TE	2.500	.625	3.000	2.000	.3770/.3780 THRU.	2.000	4.250	2.1250	1.000	.3770/.3780 x .810/.830 DP.
500 (2-1/2")	3.750	1.000	4.750	3.000	.3770/.3780 THRU.	2.630	6.250	3.1250	1.312	.3770/.3780 x 1.000/1.020 DP.
500 (2-1/2") TE	3.250	.750	3.750	2.250	.3770/.3780 THRU.	2.500	5.375	2.6875	1.250	.3770/.3780 x 1.000/1.020 DP.
700 (3")	4.750	1.000	6.000	3.000	.5020/.5030 THRU.	4.000	8.000	4.0000	2.000	.5020/.5030 x 1.250/1.270 DP.
700 (3") TE	4.000	1.000	4.500	2.750	.5020/.5030 THRU.	3.000	6.500	3.2500	1.500	.5020/.5030 x 1.250/1.270 DP.

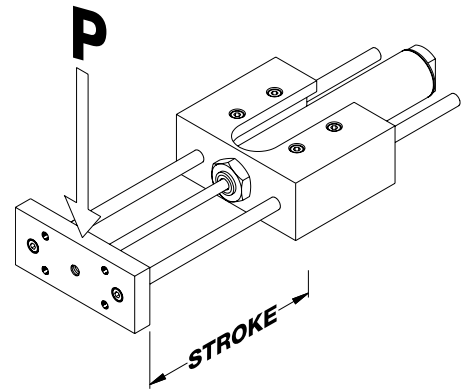
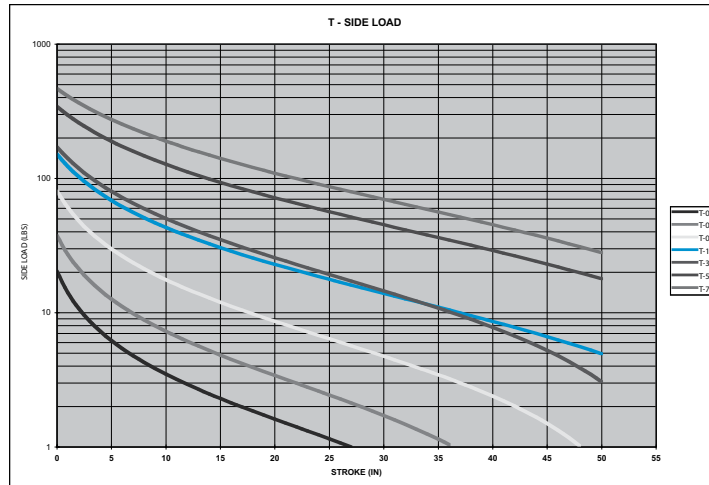
Maximum Side Loads (lbs) (TE Models)



	0	1	2	3	4	5	6	7	8	9	10	11	12	13
TE-02	76.52	55.8	41.50	31.00	24.40	19.96	16.94	14.65	12.83	11.44	10.32	9.30	8.54	7.95
TE-04	133.95	102.00	82.00	66.00	55.02	45.50	38.78	33.77	29.78	26.71	24.11	21.99	20.16	18.81
TE-09	210.00	165.60	136.00	116.00	98.00	86.00	74.00	65.00	57.00	52.00	47.00	43.00	39.00	36.46
TE-17	328.24	273.00	233.00	199.00	170.00	144.00	124.00	109.00	97.00	87.00	79.00	72.00	66.00	62.03
TE-31	425.18	359.17	310.00	271.00	240.00	211.67	183.91	162.33	145.22	131.26	119.66	109.74	101.38	95.03
TE-50	752.44	661.79	590.3	532.45	484.67	444.52	410.31	380.8	355.07	332.44	312.38	294.46	278.35	263.80
TE-70	1000.00	999.87	905.3	826.67	760.25	703.38	654.14	611.07	573.07	539.30	509.07	481.85	457.20	434.78
	14	15	16	17	18	19	20	21	22	23	24	25	26	27
TE-02	7.43	6.96	6.54	6.16	5.82	5.51	5.22	4.95	4.71	4.48	4.27	4.07	3.89	3.71
TE-04	17.61	16.53	15.57	14.70	13.90	13.18	12.51	11.89	11.32	10.79	10.30	9.84	9.41	9.00
TE-09	34.20	32.17	30.35	28.69	27.18	25.79	24.52	23.34	22.25	21.23	20.29	19.40	18.57	17.79
TE-17	58.48	55.27	52.36	49.71	47.28	45.05	42.99	41.08	39.31	37.66	36.12	34.67	33.31	32.03
TE-31	89.66	84.80	80.39	76.36	72.67	69.26	66.12	63.20	60.49	57.96	55.59	53.37	51.28	49.32
TE-50	250.57	238.5	227.44	217.25	207.85	199.14	191.04	183.49	176.43	169.82	163.62	157.77	152.26	147.06
TE-70	414.28	395.47	378.15	362.13	347.28	333.46	320.58	308.53	297.23	286.62	276.63	267.21	258.30	249.87
	28	29	30	31	32	33	34	35	36	37	38	39	40	41
TE-02	3.55	3.39	3.25	3.11	2.97	2.85	2.73	2.61	2.50	2.40	2.29	2.20	2.10	2.01
TE-04	8.62	8.25	7.91	7.59	7.28	6.98	6.70	6.43	6.18	5.93	5.69	5.47	5.25	5.04
TE-09	17.06	16.36	15.70	15.08	14.48	13.92	13.38	12.86	12.37	11.90	11.44	11.01	10.59	10.19
TE-17	30.83	29.69	28.61	27.58	26.61	25.68	24.79	23.95	23.14	22.37	21.63	20.91	20.23	19.57
TE-31	47.46	45.70	44.04	42.46	40.96	39.52	38.16	36.85	35.60	34.41	33.26	32.16	31.10	30.08
TE-50	142.13	137.46	133.02	128.79	124.77	120.93	117.27	113.76	110.41	107.19	104.10	101.13	98.27	95.52
TE-70	241.87	234.28	227.05	220.17	213.6	207.32	201.32	195.58	190.07	184.78	179.71	174.82	170.12	165.60
	42	43	44	45	46	47	48	49	50					
TE-02	1.93	1.84	1.76	1.68	1.60	1.53	1.46	1.39	1.32					
TE-04	4.83	4.64	4.45	4.26	4.09	3.91	3.75	3.58	3.43					
TE-09	9.80	9.42	9.06	8.71	8.37	8.04	7.73	7.42	7.12					
TE-17	18.94	18.33	17.74	17.17	16.61	16.08	15.56	15.06	14.58					
TE-31	29.10	28.15	27.24	26.35	25.50	24.67	23.87	23.09	22.34					
TE-50	92.87	90.32	87.85	85.47	83.16	80.93	78.77	76.67	74.64					
TE-70	161.23	157.01	152.94	149.01	145.20	141.52	137.95	134.49	131.13					

How to Specify

Maximum Side Loads (lbs) (T Models)



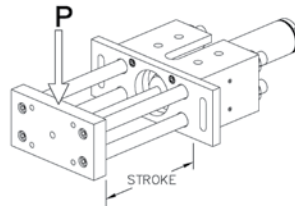
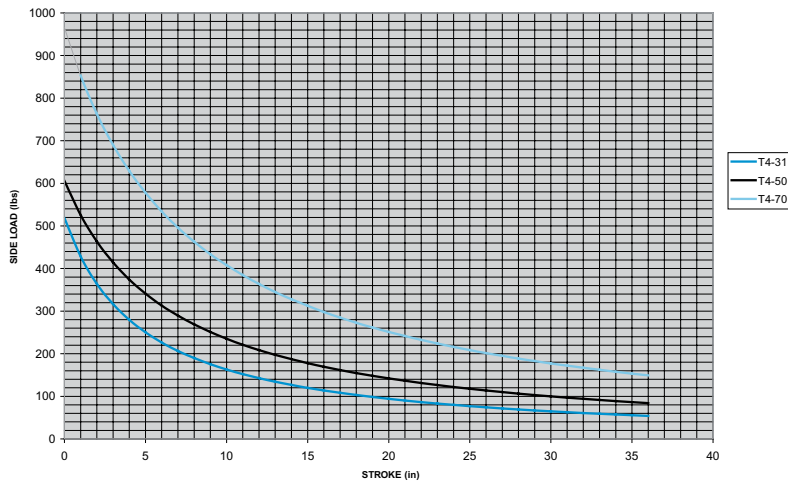
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
TE-02	20.34	14.11	10.76	8.67	7.24	6.19	5.40	4.77	4.26	3.84	3.48	3.18	2.91	2.68	2.48
TE-04	37.49	27.17	21.23	17.38	14.66	12.65	11.09	9.85	8.83	7.98	7.26	6.64	6.10	5.63	5.21
TE-09	80.50	60.61	48.46	40.26	34.34	29.87	26.37	23.54	21.22	19.27	17.61	16.17	14.92	13.82	12.83
TE-17	151.62	122.73	102.88	88.39	77.34	68.63	61.58	55.75	50.86	46.68	43.07	39.92	37.14	34.67	32.47
TE-31	171.30	140.62	118.91	102.73	90.19	80.18	72.00	65.19	59.41	54.46	50.16	46.38	43.04	40.06	37.39
TE-50	342.37	295.93	260.13	231.67	208.5	189.25	173.00	159.10	147.06	136.52	127.22	118.95	111.54	104.85	98.80
TE-70	465.67	410.17	365.92	329.78	299.7	274.27	252.46	233.56	217.00	202.37	189.34	177.66	167.13	157.57	148.86

	15	16	17	18	19	20	21	22	23	24	25	26	27	28
T-02	2.30	2.13	1.98	1.85	1.72	1.61	1.50	1.41	1.31	1.23	1.15	1.07	1.00	-
T-04	4.83	4.49	4.18	3.90	3.64	3.40	3.18	2.98	2.78	2.60	2.44	2.28	2.12	1.98
T-09	11.96	11.16	10.44	9.79	9.18	8.63	8.11	7.64	7.19	6.78	6.39	6.02	5.67	5.34
T-17	30.48	28.67	27.03	25.53	24.15	22.87	21.69	20.59	19.57	18.61	17.71	16.86	16.06	15.31
T-31	34.97	32.77	30.77	28.92	27.22	25.65	24.19	22.83	21.56	20.37	19.25	18.2	17.20	16.26
T-50	93.28	88.33	83.58	79.30	75.33	71.64	68.20	64.99	61.97	59.14	56.48	53.96	51.58	49.32
T-70	140.88	133.54	126.77	120.49	114.66	109.22	104.14	99.37	94.89	90.67	86.68	82.91	79.34	75.94

	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
T-02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T-04	1.84	1.71	1.59	1.47	1.36	1.25	1.14	1.04	-	-	-	-	-	-	-	-	-
T-09	5.03	4.74	4.45	4.18	3.93	3.68	3.45	3.22	3.00	2.79	2.59	2.39	2.20	2.02	1.84	1.67	1.50
T-17	14.60	13.92	13.28	12.66	12.08	11.52	10.98	10.47	9.98	9.50	9.05	8.61	8.19	7.78	7.38	7.00	6.63
T-31	15.36	14.51	13.70	12.93	12.19	11.48	10.80	10.15	9.52	8.92	8.34	7.78	7.24	6.72	6.21	5.72	5.24
T-50	47.18	45.14	43.20	41.35	39.58	37.89	36.26	34.70	33.21	31.77	30.38	29.05	27.76	26.51	25.30	24.14	23.01
T-70	72.72	69.64	66.71	63.90	61.22	58.64	56.18	53.8	51.52	49.33	47.21	45.16	43.19	41.28	39.43	37.64	35.91

	46	47	48	49	50
T-02	-	-	-	-	-
T-04	-	-	-	-	-
T-09	1.33	1.17	1.02	-	-
T-17	6.27	5.92	5.58	5.25	4.93
T-31	4.78	4.33	3.89	3.47	3.05
T-50	21.91	20.85	19.82	18.82	17.84
T-70	34.22	32.59	31.00	29.46	27.95

Maximum Side Loads (lbs) (T4 Models)



	0	1	2	3	4
T4-31	518.70	428.08	364.07	316.45	279.63
T4-50	605.94	525.43	463.46	414.28	374.30
T4-70	965.54	852.80	763.04	689.88	629.11

	5	6	7	8	9
T4-31	250.32	226.43	206.58	189.83	175.51
T4-50	341.16	313.25	289.41	268.83	250.86
T4-70	577.82	533.96	496.02	462.88	433.68

	10	11	12	13	14
T4-31	163.12	152.30	142.76	134.30	126.74
T4-50	235.05	221.03	208.50	197.25	187.09
T4-70	407.77	384.60	363.78	344.95	327.85

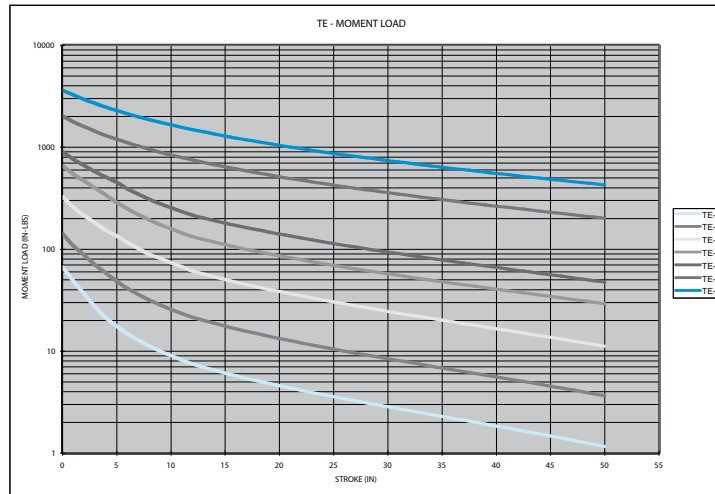
	15	16	17	18	19
T4-31	119.94	113.79	108.21	103.11	98.45
T4-50	177.86	169.45	161.75	154.67	148.14
T4-70	312.25	297.97	284.83	272.71	261.49

	20	21	22	23	24
T4-31	94.16	90.20	86.54	83.14	79.97
T4-50	142.11	136.50	131.29	126.43	129.89
T4-70	251.09	241.40	232.36	223.91	215.99

	25	26	27	28	29	30	31	32	33	34	35	36
T4-31	77.02	74.26	71.68	69.25	66.96	64.81	62.78	60.86	59.03	57.31	55.67	54.11
T4-50	117.63	113.64	109.88	106.33	102.99	99.83	96.83	94.00	91.30	88.74	86.30	83.97
T4-70	208.56	201.56	194.97	188.74	182.85	177.28	171.99	166.97	162.19	157.64	153.30	149.17

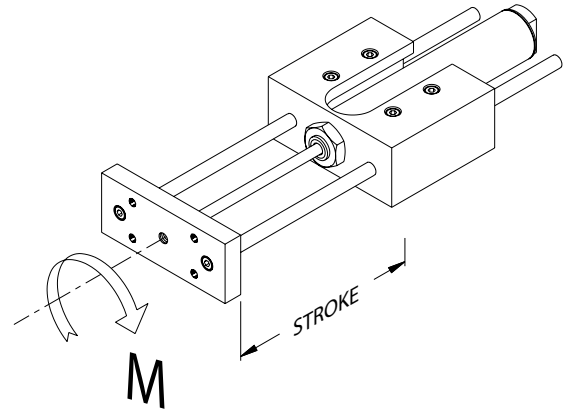
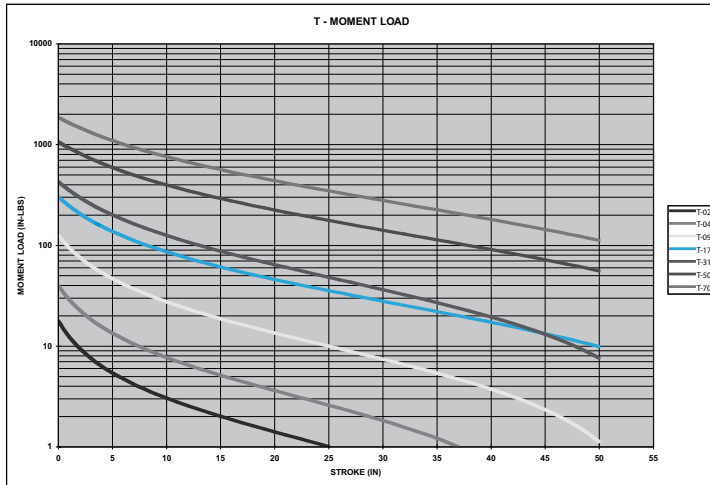
How to Specify

Maximum Moments (in-lbs) (TE Models)



	0	1	2	3	4	5	6	7	8	9	10	11	12
TE-02	66.96	48.83	36.31	27.13	21.35	17.47	14.82	12.82	11.23	10.01	9.03	8.14	7.47
TE-04	142.32	108.38	87.13	70.13	58.46	48.34	41.20	35.88	31.64	28.38	25.62	23.36	21.42
TE-09	328.12	258.75	212.50	181.25	153.13	134.38	115.63	101.56	89.06	81.25	73.44	67.19	60.94
TE-17	656.48	546.00	466.00	398.00	340.00	288.00	248.00	218.00	194.00	174	158.00	144.00	132.00
TE-31	903.51	763.24	658.75	575.88	510.00	449.80	390.81	344.95	308.59	278.93	254.28	233.2	215.43
TE-50	2022.18	1778.57	1586.43	1430.96	1302.54	1194.65	1102.70	1023.39	954.26	893.44	839.52	791.36	748.08
TE-70	3623.75	3249.57	2942.22	2686.67	2470.8	2285.99	2125.94	1985.97	1862.49	1752.72	1654.47	1566.00	1485.90
	13	14	15	16	17	18	19	20	21	22	23	24	25
TE-02	6.95	6.50	6.09	5.72	5.39	5.09	4.82	4.57	4.34	4.12	3.92	3.74	3.56
TE-04	19.98	18.71	17.57	16.54	15.62	14.77	14.00	13.29	12.64	12.03	11.47	10.94	10.45
TE-09	56.97	53.44	50.27	47.41	44.82	42.46	40.30	38.31	36.47	34.76	33.18	31.70	30.32
TE-17	124.07	116.95	110.54	104.72	99.42	94.56	90.10	85.98	82.17	78.62	75.32	72.23	69.34
TE-31	201.93	190.52	180.20	170.83	162.27	154.41	147.18	140.50	134.30	128.54	123.16	118.13	113.42
TE-50	708.96	673.41	640.97	611.24	583.87	558.60	535.18	513.41	493.13	474.16	456.40	439.72	424.01
TE-70	1413.03	1346.42	1285.29	1228.98	1176.92	1128.65	1083.75	1041.87	1002.71	966.01	931.52	899.05	868.43
	26	27	28	29	30	31	32	33	34	35	36	37	38
TE-02	3.4	3.25	3.1	2.97	2.84	2.72	2.6	2.49	2.39	2.29	2.19	2.1	2.01
TE-04	9.99	9.56	9.15	8.77	8.41	8.06	7.73	7.42	7.12	6.83	6.56	6.3	6.05
TE-09	29.02	27.8	26.65	25.56	24.53	23.56	22.63	21.74	20.9	20.1	19.33	18.59	17.88
TE-17	66.62	64.07	61.65	59.37	57.21	55.16	53.21	51.36	49.59	47.9	46.28	44.74	43.25
TE-31	108.98	104.8	100.86	97.12	93.59	90.23	87.03	83.99	81.09	78.31	75.66	73.12	70.68
TE-50	409.21	395.21	381.97	369.41	357.48	346.14	335.33	325.01	315.16	305.74	296.71	288.06	279.76
TE-70	839.48	812.08	786.09	761.4	737.91	715.54	694.19	673.8	654.3	635.63	617.73	600.55	584.05
	39	40	41	42	43	44	45	46	47	48	49	50	
TE-02	1.92	1.84	1.76	1.68	1.61	1.54	1.47	1.4	1.34	1.28	1.21	1.15	
TE-04	5.81	5.58	5.35	5.14	4.93	4.73	4.53	4.34	4.16	3.98	3.81	3.64	
TE-09	17.2	16.55	15.92	15.31	14.73	14.16	13.61	13.08	12.57	12.07	11.59	11.12	
TE-17	41.83	40.46	39.14	37.87	36.65	35.47	34.33	33.23	32.16	31.13	30.12	29.15	
TE-31	68.34	66.09	63.92	61.83	59.82	57.88	56	54.19	52.43	50.73	49.08	47.47	
TE-50	271.78	264.1	256.71	249.59	242.73	236.09	229.69	223.49	217.5	211.69	206.06	200.6	
TE-70	568.18	552.9	538.18	523.99	510.3	497.07	484.28	471.91	459.93	448.33	437.08	426.16	

Maximum Moments (in-lbs) (T-Series Models)



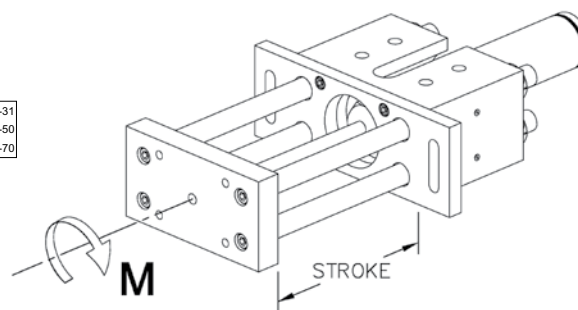
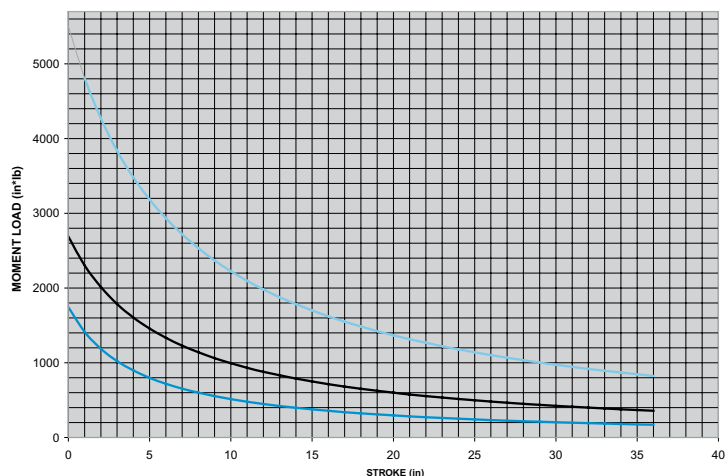
	0	1	2	3	4	5	6	7	8	9	10	11	12
T-02	17.80	12.35	9.42	7.59	6.33	5.42	4.72	4.17	3.73	3.36	3.05	2.78	2.55
T-04	39.83	28.86	22.56	18.46	15.58	13.44	11.78	10.46	9.38	8.48	7.72	7.06	6.49
T-09	125.78	94.70	75.72	62.90	53.66	46.67	41.20	36.79	33.16	30.11	27.51	25.27	23.31
T-17	303.23	245.46	205.76	176.78	154.68	137.26	123.16	111.51	101.71	93.36	86.14	79.84	74.28
T-31	428.25	351.56	297.28	256.83	225.48	200.46	180.01	162.96	148.53	136.15	125.39	115.96	107.61
T-50	1069.92	924.78	812.90	723.97	651.55	591.41	540.64	497.18	459.55	426.62	397.56	371.71	348.55
T-70	1862.69	1640.7	1463.66	1319.12	1198.81	1097.07	1009.86	934.23	868.00	809.47	757.37	710.65	668.51
	13	14	15	16	17	18	19	20	21	22	23	24	25
T-02	2.35	2.17	2.01	1.86	1.73	1.62	1.51	1.41	1.32	1.23	1.15	1.08	1.01
T-04	5.98	5.54	5.13	4.77	4.45	4.15	3.87	3.62	3.38	3.16	2.96	2.77	2.59
T-09	21.59	20.05	18.68	17.44	16.32	15.29	14.35	13.48	12.68	11.93	11.24	10.59	9.98
T-17	69.35	64.93	60.95	57.35	54.06	51.06	48.30	45.74	43.38	41.18	39.13	37.22	35.42
T-31	100.16	93.47	87.43	81.93	76.91	72.31	68.06	64.13	60.48	57.08	53.91	50.93	48.13
T-50	327.67	308.74	291.49	275.71	261.19	247.80	235.40	223.87	213.12	203.08	193.66	184.82	176.49
T-70	630.29	595.44	563.53	534.18	507.08	481.98	458.64	436.89	416.54	397.47	379.55	362.66	346.72
	26	27	28	29	30	31	32	33	34	35	36	37	38
T-02	-	-	-	-	-	-	-	-	-	-	-	-	-
T-04	2.42	2.26	2.10	1.96	1.82	1.69	1.56	1.44	1.33	1.21	1.11	1.00	-
T-09	9.40	8.86	8.35	7.86	7.40	6.96	6.54	6.14	5.75	5.38	5.03	4.69	4.36
T-17	33.72	32.13	30.62	29.19	27.84	26.55	25.33	24.16	23.04	21.97	20.94	19.96	19.01
T-31	45.49	43.00	40.64	38.40	36.27	34.25	32.31	30.47	28.70	27.00	25.37	23.81	22.30
T-50	168.62	161.18	154.13	147.44	141.07	135.01	129.22	123.69	118.39	113.32	108.45	103.77	99.27
T-70	331.64	317.35	303.78	290.87	278.56	266.83	255.61	244.87	234.58	224.70	215.22	206.09	197.30
	39	40	41	42	43	44	45	46	47	48	49	50	
T-02	-	-	-	-	-	-	-	-	-	-	-	-	
T-04	-	-	-	-	-	-	-	-	-	-	-	-	
T-09	4.04	3.74	3.44	3.15	2.87	2.60	2.34	2.08	1.83	1.59	1.36	1.13	
T-17	18.10	17.22	16.37	15.56	14.77	14.00	13.26	12.54	11.84	11.17	10.51	9.87	
T-31	20.85	19.45	18.10	16.79	15.52	14.29	13.10	11.95	10.82	9.73	8.66	7.63	
T-50	94.94	90.77	86.74	82.84	79.08	75.43	71.90	68.48	65.16	61.94	58.80	55.75	
T-70	188.83	180.65	172.76	165.12	157.73	150.57	143.63	136.90	130.36	124.00	117.82	111.81	

Frictional characteristics of TE Series Linear Thrusters deteriorate as stroke length increases.

NOTE: Static load data represented

How to Specify

Maximum Moment Loads (in-lbs) (T4 Models)



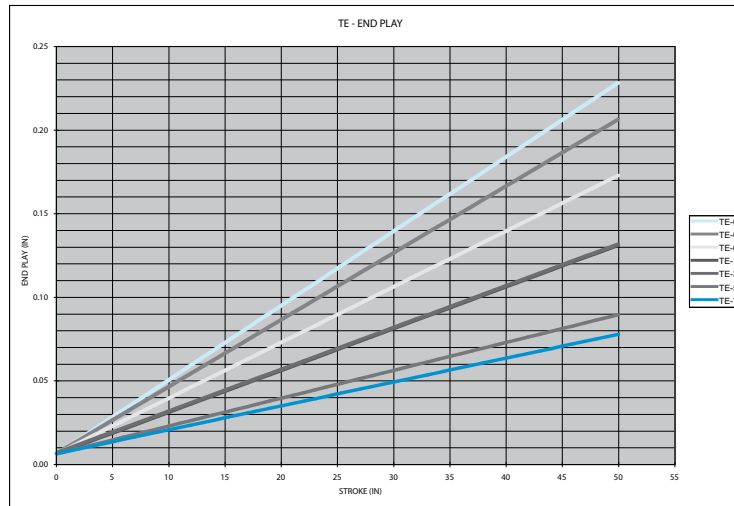
NOTE: Static load data represented.

	0	1	2	3	4	5	6	7	8	9	10	11	12
T4-31	1745.02	1413.35	1186.76	1022.14	897.12	798.95	719.81	654.66	600.09	553.72	513.83	479.14	448.70
T4-50	2687.72	2302.45	2012.74	1786.95	1606.03	1457.82	1334.17	1229.45	1139.62	1061.71	993.50	933.28	879.73
T4-70	5504.63	4810.54	4269.61	3836.17	3481.08	3184.85	2933.96	2718.74	2532.09	2368.66	2224.38	2096.06	1981.20

	13	14	15	16	17	18	19	20	21	22	23	24	25
T4-31	421.78	397.80	376.30	356.91	339.34	323.35	308.72	295.30	282.94	271.51	260.92	251.08	241.91
T4-50	831.79	788.63	749.56	714.03	681.58	651.83	624.44	599.16	575.74	553.99	533.74	514.83	497.13
T4-70	1877.78	1784.17	1699.04	1621.28	1549.98	1484.36	1423.77	1367.65	1315.53	1266.98	1221.66	1179.25	1139.48

	26	27	28	29	30	31	32	33	34	35	36
T4-31	233.34	225.32	217.79	210.71	204.05	197.76	191.82	186.19	180.86	175.80	170.99
T4-50	480.54	464.95	450.27	436.43	423.36	410.99	399.26	388.14	377.57	367.51	357.94
T4-70	1102.11	1066.93	1033.75	1002.40	972.75	944.64	917.97	892.63	868.51	845.54	823.63

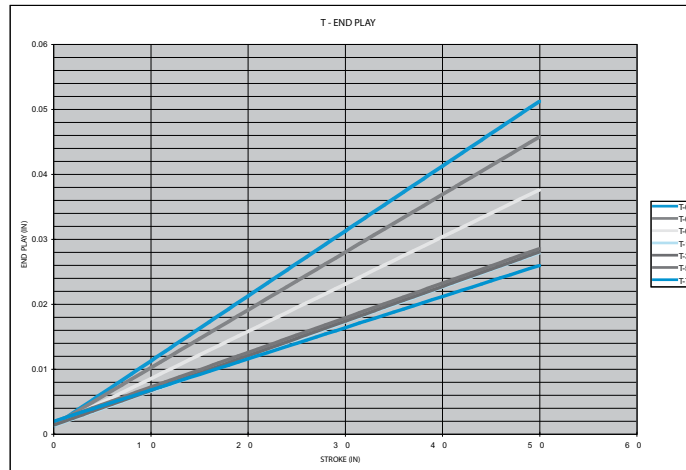
Tooling Plate End Play (in) (TE Models)



	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
TE-02	0.006	0.011	0.015	0.019	0.024	0.028	0.033	0.037	0.042	0.046	0.051	0.055	0.059	0.064	0.068	0.073	0.077
TE-04	0.007	0.011	0.015	0.019	0.023	0.027	0.031	0.035	0.039	0.043	0.047	0.051	0.055	0.059	0.063	0.067	0.071
TE-09	0.006	0.010	0.013	0.016	0.020	0.023	0.026	0.030	0.033	0.036	0.040	0.043	0.046	0.050	0.053	0.056	0.060
TE-17	0.006	0.009	0.011	0.014	0.016	0.019	0.021	0.024	0.026	0.029	0.031	0.034	0.036	0.039	0.041	0.044	0.046
TE-31	0.007	0.009	0.012	0.014	0.017	0.019	0.022	0.024	0.027	0.029	0.032	0.034	0.037	0.039	0.042	0.044	0.047
TE-50	0.006	0.008	0.010	0.011	0.013	0.015	0.016	0.018	0.020	0.021	0.023	0.025	0.026	0.028	0.030	0.031	0.033
TE-70	0.006	0.008	0.009	0.011	0.012	0.014	0.015	0.016	0.018	0.019	0.021	0.022	0.024	0.025	0.026	0.028	0.029
	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
TE-02	0.082	0.086	0.091	0.095	0.099	0.104	0.108	0.113	0.117	0.122	0.126	0.131	0.135	0.139	0.144	0.148	0.153
TE-04	0.075	0.079	0.083	0.087	0.091	0.095	0.099	0.103	0.107	0.111	0.115	0.119	0.123	0.127	0.131	0.135	0.139
TE-09	0.063	0.066	0.070	0.073	0.076	0.080	0.083	0.086	0.090	0.093	0.096	0.100	0.103	0.106	0.110	0.113	0.116
TE-17	0.049	0.051	0.054	0.056	0.059	0.061	0.064	0.066	0.069	0.071	0.074	0.076	0.079	0.081	0.084	0.086	0.089
TE-31	0.049	0.052	0.054	0.057	0.059	0.062	0.064	0.067	0.069	0.072	0.074	0.077	0.079	0.082	0.084	0.087	0.089
TE-50	0.035	0.036	0.038	0.040	0.041	0.043	0.045	0.046	0.048	0.050	0.051	0.053	0.055	0.056	0.058	0.060	0.061
TE-70	0.031	0.032	0.034	0.035	0.036	0.038	0.039	0.041	0.042	0.044	0.045	0.046	0.048	0.049	0.051	0.052	0.054
	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
TE-02	0.157	0.162	0.166	0.171	0.175	0.179	0.184	0.188	0.193	0.197	0.202	0.206	0.211	0.215	0.219	0.224	0.228
TE-04	0.143	0.147	0.151	0.155	0.159	0.163	0.167	0.171	0.175	0.179	0.183	0.187	0.191	0.195	0.199	0.203	0.207
TE-09	0.120	0.123	0.126	0.130	0.133	0.136	0.140	0.143	0.146	0.150	0.153	0.156	0.160	0.163	0.166	0.17	0.173
TE-17	0.091	0.094	0.096	0.099	0.101	0.104	0.106	0.109	0.111	0.114	0.116	0.119	0.121	0.124	0.126	0.129	0.131
TE-31	0.092	0.094	0.097	0.099	0.102	0.104	0.107	0.109	0.112	0.114	0.117	0.119	0.122	0.124	0.127	0.129	0.132
TE-50	0.063	0.065	0.066	0.068	0.070	0.071	0.073	0.075	0.076	0.078	0.080	0.081	0.083	0.085	0.086	0.088	0.09
TE-70	0.055	0.056	0.058	0.059	0.061	0.062	0.064	0.065	0.066	0.068	0.069	0.071	0.072	0.074	0.075	0.076	0.078

How to Specify

Tooling Plate End Play (in) (T-Series Models)



	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
T-02	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	0.01	0.011	0.012	0.013	0.014	0.015	0.016
T-04	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.008	0.009	0.01	0.011	0.012	0.013	0.014	0.015
T-09	0.001	0.002	0.003	0.003	0.004	0.005	0.006	0.006	0.007	0.008	0.009	0.009	0.01	0.011	0.011	0.012
T-17	0.001	0.002	0.002	0.003	0.003	0.004	0.004	0.005	0.006	0.006	0.007	0.007	0.008	0.008	0.009	0.009
T-31	0.001	0.002	0.002	0.003	0.004	0.004	0.005	0.005	0.006	0.006	0.007	0.007	0.008	0.008	0.009	0.009
T-50	0.002	0.002	0.003	0.004	0.004	0.005	0.005	0.006	0.006	0.007	0.007	0.008	0.008	0.009	0.009	0.01
T-70	0.002	0.002	0.003	0.003	0.004	0.004	0.005	0.005	0.006	0.006	0.007	0.007	0.008	0.008	0.009	0.009

	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
T-02	0.017	0.018	0.019	0.02	0.021	0.022	0.023	0.024	0.025	0.026	0.027	0.028	0.029	0.03	0.031	0.032
T-04	0.016	0.016	0.017	0.018	0.019	0.02	0.021	0.022	0.023	0.024	0.024	0.025	0.026	0.027	0.028	0.029
T-09	0.013	0.014	0.014	0.015	0.016	0.017	0.017	0.018	0.019	0.019	0.02	0.021	0.022	0.022	0.023	0.024
T-17	0.01	0.01	0.011	0.011	0.012	0.012	0.013	0.014	0.014	0.015	0.015	0.016	0.016	0.017	0.017	0.018
T-31	0.01	0.01	0.011	0.012	0.012	0.013	0.013	0.014	0.014	0.015	0.015	0.016	0.016	0.017	0.017	0.018
T-50	0.01	0.011	0.012	0.012	0.013	0.013	0.014	0.014	0.015	0.015	0.016	0.016	0.017	0.017	0.018	0.018
T-70	0.01	0.01	0.011	0.011	0.012	0.012	0.013	0.013	0.014	0.014	0.014	0.015	0.015	0.016	0.016	0.017

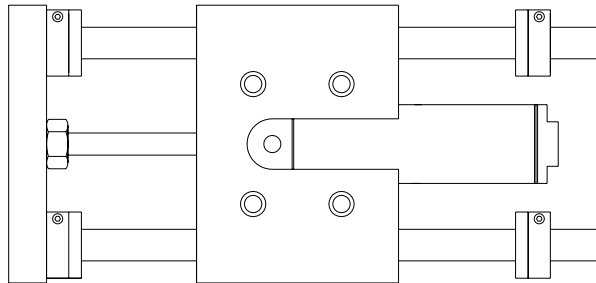
	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
T-02	0.033	0.034	0.035	0.036	0.037	0.038	0.039	0.04	0.041	0.042	0.043	0.044	0.045	0.046	0.047	0.048
T-04	0.03	0.031	0.032	0.032	0.033	0.034	0.035	0.036	0.037	0.038	0.039	0.04	0.04	0.041	0.042	0.043
T-09	0.025	0.025	0.026	0.027	0.027	0.028	0.029	0.03	0.03	0.031	0.032	0.033	0.033	0.034	0.035	0.035
T-17	0.018	0.019	0.019	0.02	0.02	0.021	0.022	0.022	0.023	0.023	0.024	0.024	0.025	0.025	0.026	0.026
T-31	0.018	0.019	0.02	0.02	0.021	0.021	0.022	0.022	0.023	0.023	0.024	0.024	0.025	0.025	0.026	0.026
T-50	0.019	0.02	0.02	0.021	0.021	0.022	0.022	0.023	0.023	0.024	0.024	0.025	0.025	0.026	0.026	0.027
T-70	0.017	0.018	0.018	0.019	0.019	0.02	0.02	0.021	0.021	0.022	0.022	0.023	0.023	0.024	0.024	0.025

	48	49	50
T-02	0.049	0.05	0.051
T-04	0.044	0.045	0.046
T-09	0.036	0.037	0.038
T-17	0.027	0.027	0.028
T-31	0.027	0.028	0.028
T-50	0.028	0.028	0.029
T-70	0.025	0.026	0.026

External Bumpers

The stroke can be adjusted with external urethane bumpers. These are available on one or both ends (-EB1 and -EB2 options). They are 1/4" thick through 2" bore, 1/2" for 2-1/2" bore, and 3/4" for 3" bore and fit over the guide shafts at the ends of the housing (see illustration). Shaft collars are supplied with each set of bumpers to eliminate movement possible with high loads and velocities. Thus, with -EB1 option, there will be a total of two collars; with -EB2 option, there will be four shaft collars. Guide shafts are lengthened so stroke on extension isn't affected; however, bumpers reduce the retraction stroke (see charts below). Higher loads and velocities may dictate the use of external means of deceleration such as shock absorbers.

Guide Shaft Extension with Bumpers (in.)	
Bore Size	Length Adder
9/16"	0.5
3/4"	0.5
1-1/16"	0.63
1-1/2"	0.75
2"	0.875
2-1/2"	1.38
3"	1.50



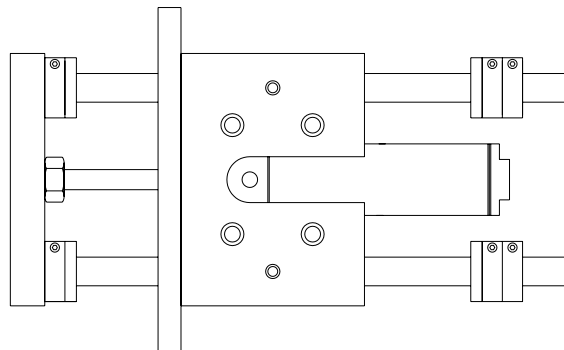
Retraction Stroke Reduction with Bumpers (in.)		
Bore Size	Reduction	
	Standard	With Mounting Plate Option
9/16"	0.34	0.59
3/4"	0.28	0.66
1-1/16"	0.31	0.69
1-1/2"	0.25	0.75
2"	0	0.75
2-1/2"	.25	1.06
3"	.31	1.31

External Bumpers (T Models)

The stroke can be adjusted with external urethane bumpers. These are available on one or both ends (-EB1 and -EB2 options). They are 1/4" thick through 2" bore, 1/2" for 2-1/2" bore, and 3/4" for 3" bore and fit over the guide shafts at the ends of the housing (see illustration). Shaft collars are supplied with each set of bumpers to eliminate movement possible with high loads and velocities. Thus, with -EB1 option, there will be a total of four collars; with -EB2 option, there will be six shaft collars.

Flat stainless steel washers are also installed to protect the shaft seals from impact damage. Guide shafts are lengthened so stroke on extension isn't affected; however, bumpers reduce the retraction stroke if the mounting plate is used in the shipped position (see charts below). Higher loads and velocities may dictate the use of external means of deceleration such as shock absorbers.

Guide Shaft Extension with Bumpers (in.)	
Bore Size	Length Adder
9/16"	0.5
3/4"	0.5
1-1/16"	0.63
1-1/2"	0.75
2"	0.875
2-1/2"	1.38
3"	1.50



Retraction Stroke Reduction with Bumpers (in.)		
Bore Size	With Mounting Plate	Without Mounting Plate
9/16"	0.56	0.31
3/4"	0.62	0.24
1-1/16"	0.70	N/A
1-1/2"	0.73	0.25
2"	0.81	N/A
2-1/2"	1.06	0.31
3"	1.31	0.31

NOTE: The single set of shaft collars supplied with each Linear Thruster are for setup only. DO NOT use them to limit the stroke or damage can occur. Thin washer included with EB Option to protect housing wipers from impact damage.

How to Specify

External Bumpers (T4 Models)

The stroke can be adjusted with external urethane bumpers. These are available on one or both ends (-EB1 and -EB2 options). They fit over the guide shafts at the ends of the housing. Shaft collars are supplied with each set of bumpers to eliminate movement possible with high loads and velocities. Thus, with -EB1 option, there will be a total of eight collars; with -EB2 option, there will be twelve shaft collars.

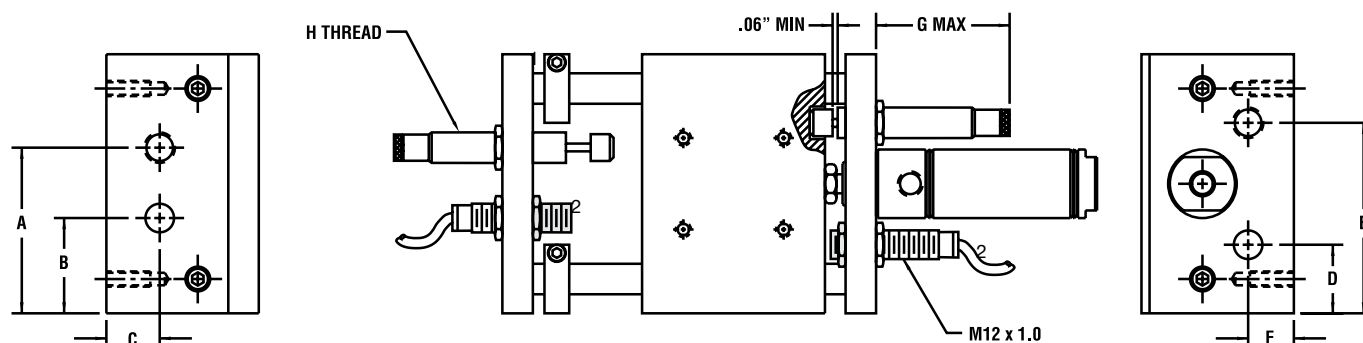
Flat stainless steel washers are also installed to protect the shaft seals from impact damage. Guide shafts are lengthened so stroke on extension isn't affected; however, bumpers reduce the retraction stroke if the mounting plate is used in the shipped position (see charts below). Higher loads and velocities may dictate the use of external means of deceleration such as shock absorbers.

Guide Shaft Extension with Bumpers (in)	
Bore Size	Length Adder
2"	0.875
2-1/2"	1.38
3"	1.50

Retraction Stroke Reduction with Bumpers (in)		
Bore Size	With Mounting Plate	Without Mounting Plate
2"	0.81	0.25
2-1/2"	1.06	0.50
3"	1.31	0.75

NOTE: The single set of shaft collars supplied with each Linear Thruster are for setup only. DO NOT use them to limit the stroke or damage can occur. Thin washer included with EB Option to protect housing wipers from impact damage.

Options



NOTE: Maintain the .06" clearance gap between the nylon cap and shock absorber housing to prevent damage to the shock absorber.

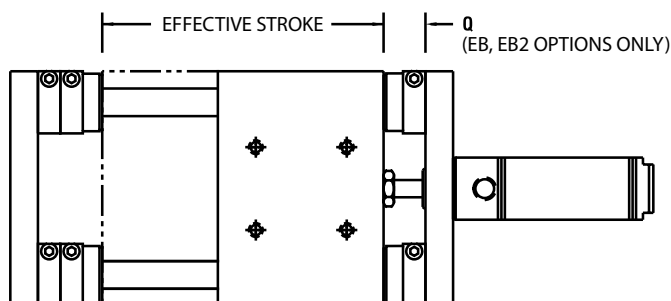
1 The single shaft collars supplied with each Linear Thruster are intended for setup purposes only. They must not be used to limit the stroke or serious damage to the Linear Thruster may occur!

2 Position sensing switch shown in drawing is sold separately.

Model	A	B	C	D	E	F	G	H
02	1.88	1.13	0.56	0.84	2.17	0.40	3.00	.500-20
04/09	2.65	1.60	1.50	1.13	3.13	0.75	3.75	.750-16
17	3.50	2.00	1.75	1.46	4.00	0.84	3.25	.750-16
31/50	3.50	2.25	2.00	1.75	5.31	0.90	4.75	1.00-12
70	5.50	3.50	2.75	1.75	9.25	4.19	4.80	1.00-12

Stroke Reduction Table

Bore	External Bumper Option			Q
	EB	EB1	EB2	
02	0.41	0.17	0.58	0.62
04/09	0.48	0.18	0.66	0.69
17	0.37	0.32	0.69	0.75
31	0.00	0.47	0.47	0.81
50	0.00	0.39	0.39	0.81
70	0.80	0.00	0.80	1.31



How to Order

The model number of T-Series Linear Thrusters consists of three alphanumeric clusters designating product type, bore size, stroke lengths, and other optional components that together make up the complete part number to use in ordering. Use the ordering information below to build a valid part number. **Please note that the following features are standard, and are included in all model numbers: E (inch series threading) and M (magnetic position sensing).**

All options listed below are to be alphabetically applied to the last part of your Thruster part number, except the EEx.xx option which is length sensitive and should be listed at the very end of all the options selected.

Options are listed below in three categories for improved organization and understanding.

An example of a basic T Series unit with a 3/4" bore, 6" stroke, adjustable cushions, and a magnet for position sensing.

Model		Bore Size		Standard Stroke Lengths*	
				Bore	Stroke Lengths
T	Ball Bearing Thruster	02	9/16"	02	1" increments up to 6"
TF	Position Feedback, Ball Bearing Thruster (09-70 bores)	04	3/4"	04	1" increments up to 12"
		09	1-1/16"	09	
		17	1-1/2"	17	
		31	2"	31	
TV	Ball Bearing Thruster with the cylinder omitted	50	2-1/2"	50	
		70	3"	70	

*Stroke lengths beyond maximum are available; the rear of the cylinder must be supported in horizontal applications. Contact Bimba or your local distributor for pricing.

T - 04 6 - CM

Thruster Housing Options	
D	Dowel pin holes for Transition Plates ¹
EB1	External Bumpers, Extend (one set) (see page 319)
EB2	External Bumpers, Both Ends (two sets) (see page 319)
	Shock Absorbers ²
K _ _	First _ will be 1 (Shock both ends)
	2 (Shock extend only)
	3 (Shock retract only)
	Second _ will be 1 (Light shock)
	2 (Standard shock)
	3 (Heavy shock)
NP	No Mounting Plate
S	Stainless Steel Tooling Plate, Shafts, and Collars ²

Cylinder Options	
B	Cylinder option for internal bumpers ^{3,4}
C	Cylinder option for adjustable cushions ^{3,4}
M	MRS [®] magnetic position sensing ⁵
N	Cylinder option for low temperature service lubricant and seals ⁴
Q	Cylinder option for side ported read head ⁴
T1	Cylinder option for low profile switch track ⁴
V	Cylinder option for high temperature seals and lubricant ⁴
EEX.XX	Cylinder and thruster guide shaft option for extra rod and guide shaft extension ⁴
99	Cylinder option for oil pre-lubrication ⁴

PFC Cylinder Options	
L	PFC cylinder option for low friction seals ⁶
PC	PFC cylinder option for M8 corded connector ⁶
PA	PFC cylinder option for M8 plug connector ⁶

¹ Transition Plate Applications: Option -D must be ordered if dowel pin holes are required. Not available in 2-1/2" and 3" bores with S option. Dowel pin hole locations shown in Appendix.

² Not available in 2-1/2" and 3" bores.

³ Internal bumpers and cushions cannot be ordered in combination. Adjustable cushions are not available for 9/16" bore size.

⁴ See Original Line catalog section for more details.

⁵ Hall Effect Switch not available for 9/16" bore size.

⁶ See PFC catalog section for more information.

Approximate Power Factors		
9/16"	=	0.2
3/4"	=	0.4
1-1/16"	=	0.9
1-1/2"	=	1.7
2"	=	3.1
2-1/2"	=	5.0
3"	=	7.0

For example, a T-046-CM will exert a force of 0.4 times the air line pressure; a T-173-M will exert a force of 1.7 times the air pressure, etc.

The model number of Multiple Position Linear Thrusters consists of three alphanumeric clusters designating product type, bore size, stroke lengths, and other optional components that together make up the complete part number to use in ordering. Use the ordering information below to build a valid part number.

An example of a basic Multiple Position Linear Thruster model with a ball bearing 1-1/16" thruster, initial 1" stroke to the intermediate position, and a total stroke of 3" with a magnet for position sensing.

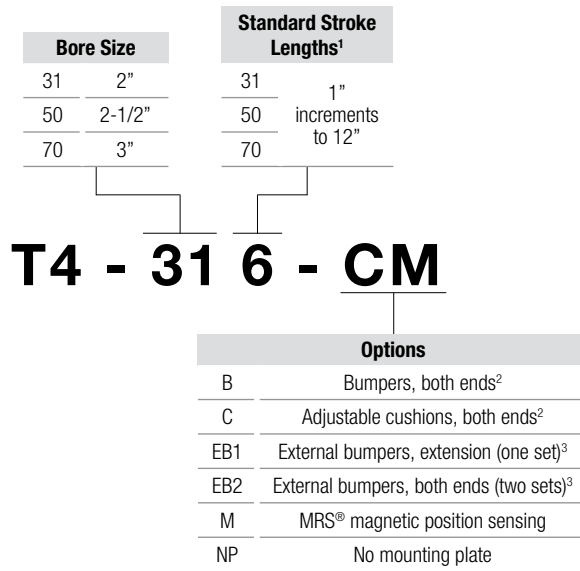
Model		Stroke Lengths				Standard Strokes and Stroke Maximums
		Stroke A		Stroke B		
		Inches	Code	Inches	Code	
T	Ball Bearing Thruster	1/2	0.5	1/2	0.5	1" increments to 12" Stroke A + Stroke B Maximum 12"
TE	Composite Bearing Thruster	1	1	1	1	

<

How to Order

The model number of T4 Linear Thrusters consists of three alphanumeric clusters designating product type, bore size, stroke length, and other optional components that together make up the complete part number to use in ordering. Use the ordering information below to build a valid part number.

An example of a basic T4 unit with a 2" bore, 6" stroke, adjustable cushions, and a magnet for position sensing.



¹ Stroke lengths beyond maximum are available; the rear of the cylinder must be supported in horizontal applications.

² Internal bumpers and cushions cannot be ordered in combination.

³ Shock Absorbers available upon request.

NOTE: For Multiple Position, specify Stroke A/Stroke B.

Approximate Power Factors		
2"	=	3.1
2-1/2"	=	5.0
3"	=	7.0

For example, a T-31-CM will exert a force of 3.1 times the air line pressure.

The model number of Movable Housing Linear Thrusters consists of three alphanumeric clusters designating product type, bore size, stroke length, and other optional components that together make up the complete part number to use in ordering. Use the ordering information below to build a valid part number.

An example of a basic Movable Housing Linear Thruster model with a 1-1/16" bore, 6" stroke movable housing, external bumpers, and a magnet for position sensing.

Model		Stroke Lengths	
TMH	Ball Bearing Movable Housing Thruster	1" to 12"	1" increments standard
TEMH	Composite Bearing Movable Housing Thruster	Any length available	
TMHF/TEMHF	Movable Housing Thruster with Position Feedback (09-70 bores only)	Multiple Position: specify stroke A or stroke B	
TMHV/TEMHV	Movable Housing Thruster without the cylinder	32" stroke maximum	

Bore Size		Options	
02	9/16"	Enter in alphabetical order	
04	3/4"	B	Internal bumpers
09	1-1/16"	C	Cushions, both ends
17	1-1/2"	E	Non-lube service seals and lubrication
31	2"	EB	External bumpers, retract
50	2-1/2"	EB1	External bumpers, extend
70	3"	EB2	External bumpers, both ends
		F	MolyCoated body
		G	Grease lubricant
		K _ _	Shock absorbers (specify as Thrusters)
		L	PFC lip seal
		M	Magnet
		N	Low temperature service seals and lubrication
		Q	Side ported rear head, ports kept in-line
		S	Stainless steel shafts
		T1, T2, T3	Switch track(s) used to accommodate miniature track mounting
		V	High temperature seals and lubrication (bumpers stay)
		Z	Bimba 500 Hydraulic Cylinder replaces air cylinder

TMH - 09 6 - EB2M

How to Repair

Repair Parts (TE Models)

Add the bore size to the basic model number shown below. For the Basic Shaft, specify the stroke length in inches and indicate options -EB1 or -EB2 as applicable. For example, shaft collars for a 1-1/16" bore Linear Thruster Series TE would be SCTE-09. The Basic Shaft for the same thruster with 8-1/2" stroke would be BSTE-09-8.5. Cylinder repair part number corresponds to number shown on cylinder shipped with Linear Thruster.

Part Number	Description	Quantity
BTE- _	Shaft Bearing	4
BSTE- _	-X.XX Basic Shaft	2
EBTE- _	External Bumper	2 or 4
LT-Bore Stroke-D	Cylinder	1
LT-Bore Stroke-DB	Cylinder	1
LT-Bore Stroke-DM*	Cylinder	1
LT-Bore Stroke-DBM*	Cylinder	1
LTC-Bore Stroke-D	Cylinder	1
LTC-Bore Stroke-DM	Cylinder	1
SCTE- _	Shaft Collars	2 or 4
TNTE- _	Cylinder Lock Nut	1

*For 1-1/16" bore use LTE prefix.

NOTE: Part numbers listed are individual components.
Order the quantity needed to be replaced.

Repair Parts (T Models)

Add the bore size to the basic model number shown below. For the Basic Shaft, specify the stroke length in inches and indicate options -EB1 or -EB2 and -S as applicable. For example, shaft seals for a 1-1/16" bore Linear Thruster would be S-09. The Basic Shaft for the same thruster with 8-1/2" stroke would be BS-09-8.5. Cylinder repair part number corresponds to number shown on cylinder shipped with Linear Thruster.

Part Number	Description	Quantity
B-	Shaft Bearing	4
BS-	-X.XX Basic Shaft	2
EB-	External Bumper Assembly	2 or 4
LT-Bore Stroke-D	Cylinder	1
LT-Bore Stroke-DB	Cylinder	1
LT-Bore Stroke-DM*	Cylinder	1
LT-Bore Stroke-DBM*	Cylinder	1
LTC-Bore Stroke-D	Cylinder	1
LTC-Bore Stroke-DM	Cylinder	1
S-	Shaft Seal	4
SC-	Shaft Collars	2, 4 or 6
TN-	Cylinder Lock Nut	1

NOTE: We recommend that if bearings are replaced, seals be replaced at the same time. Part numbers listed are individual components. Order the quantity needed to be replaced.

*For 1-1/16" bore use LTE prefix.

Repair Parts (T4 Models)

Add the bore size to the basic model number shown below. For the Basic Shaft, specify the stroke length in inches and indicate options -EB1 or -EB2 as applicable. Cylinder repair part number corresponds to number shown on cylinder shipped with Linear Thruster.

Part Number	Description	Quantity
B-	Shaft Bearing	8
BS-	-X.XX Basic Shaft	4
EB-	External Bumper Assembly	4 or 8
LT-Bore Stroke-D	Cylinder	1
LT-Bore Stroke-DB	Cylinder	1
LT-Bore Stroke-DM	Cylinder	1
LT-Bore Stroke-DBM	Cylinder	1
LTC-Bore Stroke-D	Cylinder	1
LTC-Bore Stroke-DM	Cylinder	1
S-	Shaft Seal	8
SC-	Shaft Collars	4, 8 or 16
TN-	Cylinder Lock Nut	1

NOTE: We recommend that if bearings are replaced, seals be replaced at the same time. Part numbers listed are individual components. Order the quantity needed to be replaced.

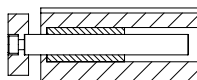
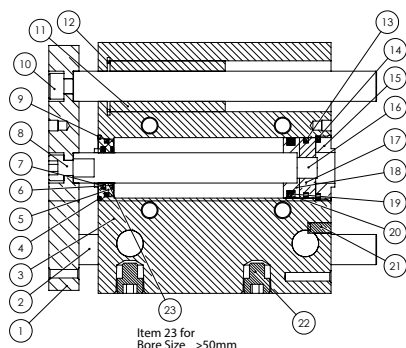
Product Features

MTC Extruded Thrusters

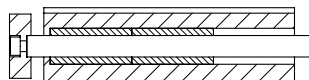
Engineering Specifications

Bore Size (mm)		12	16	20	25	32	40	50	63
Fluid		Air (Clean/Dry)							
Action		Double Acting							
Pressure Range		14 to 145 PSI (0.1 to 1.0 MPa)							
Proof Pressure		215 PSI (1.5 MPa)							
Temperature Range		-4 °F to 158 °F (-20 °C to 70 °C)							
Lubrication		Not Required							
Cushion Type		Bumper							
Speed Range		30 to 500 mm/s							
Stroke Tolerance		+1.0 / -0							
Non-Rotating Tolerance	Linear Bushing (MTCL)	± 0.08°		± 0.07°		± 0.06°		± 0.05°	
	Brass Bushing (MTCM)	± 0.10°		± 0.09°		± 0.08°		± 0.06°	
Port Size		M5X0.8		1/8NPT		1/4NPT			
Sensor Switch Compatibility ¹	Reed Switch	MCS1-G							
	Solid State Switch	MDS1-G							

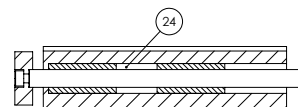
¹ See Switch chapter for switch specifications



Type	Bore Size	Stroke
MTCL	Ø12 ~ Ø16	≤30mm
	Ø20 ~ Ø63	≤50mm
MTCM	Ø12 ~ Ø63	≤50mm



Type	Bore Size	Stroke
MTCL	Ø12 ~ Ø16	30<Stroke≤100mm
	Ø20 ~ Ø63	50<Stroke≤100mm
MTCM	Ø12 ~ Ø63	50<Stroke≤100mm



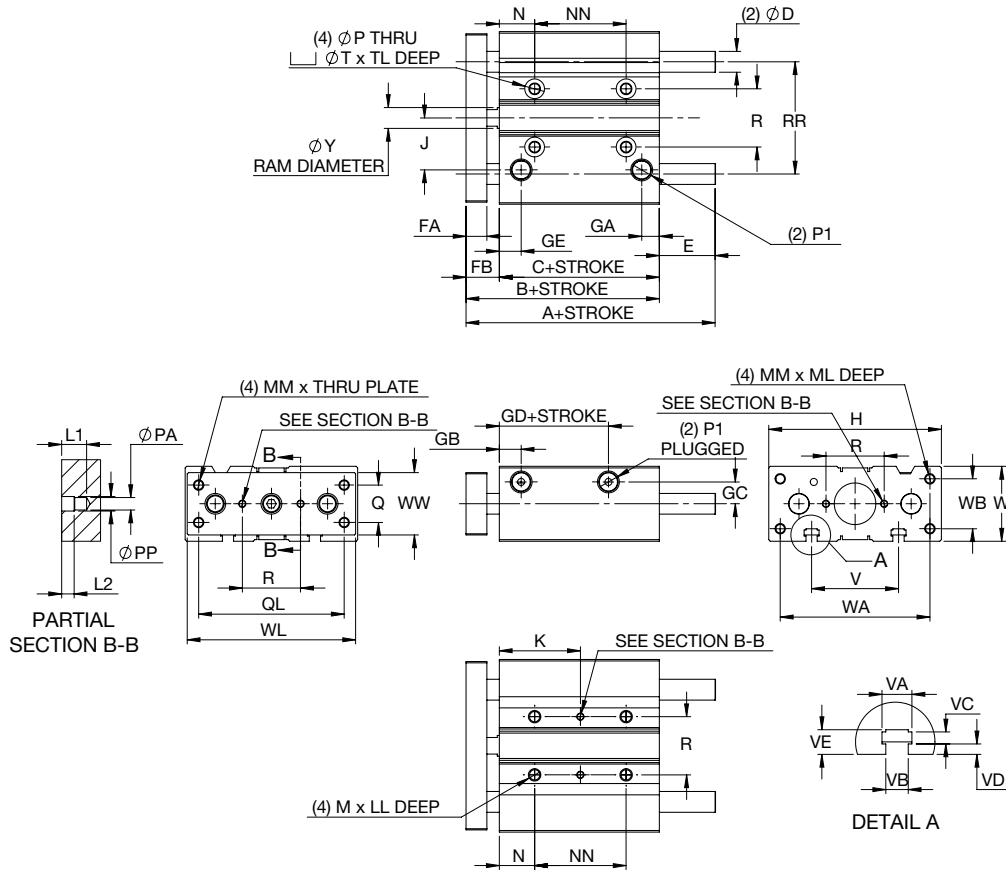
Type	Bore Size	Stroke
MTCL	Ø12 ~ Ø63	>100mm
MTCM	Ø12 ~ Ø63	>100mm

Materials

No.	Item	Material	No.	Item	Material
1	Tooling Plate	Free-Machining Steel	13	O-Ring	NBR
2	Guide Shaft	SAE440/SUS440C Steel; Chrome Plated	14	O-Ring	NBR
3	Body	Aluminum; 6463-T5; Anodized	15	Rear Cap	Brass; Ni Plated
4	Retaining Ring	Spring Steel	16	Piston Rod	Carbon Steel; Chrome Plated
5	Rod Guide	Brass; Ni Plated	17	Piston	Brass; Ni Plated
6	Bumper	Urethane	18	Magnet Seat	Brass; Ni Plated
7	Rod Seal	NBR	19	Magnet Washer	NBR
8	Screw	Stainless Steel	20	Magnet	Sintered Metal (Neodymium)
9	O-Ring	NBR	21	Plug	Carbon Steel; Zinc Plated
10	Screw/Rivet ²	Stainless Steel	22	Auxiliary Port Plug	Carbon Steel; Zinc Plated
11	Bearing	MTCM: Bronze MTCL: Steel Ball	23	Rod Bearing	Bronze (50mm and 63mm only)
12	Retaining Ring	Spring Steel	24	Spacer	Aluminum Alloy

² Item number 10 on MTCL-12 and MTCL-16 thrusters are screws. All other thrusters are rivets.

Dimensions (mm)



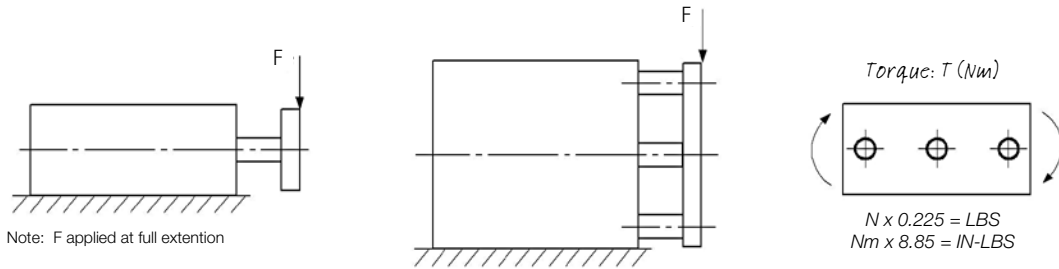
How to Specify

Dimensions (mm)

	Stroke (mm)	Bore Size (mm)			
		12	16	20	25
A	0-30	42	46	53	53.5
	31-100	55	65	80	82
	101-200	85	95	104	104.5
	201+	-	-	122	122
B		42	46	53	53.5
C		29	33	37	37.5
D		6 (MTCL) 8 (MTCM)	8 (MTCL) 10 (MTCM)	10 (MTCL) 12 (MTCM)	12 (MTCL) 16 (MTCM)
E	0-30	0	0	0	0
	31-50	13 (MTCL) 0 (MTCM)	19 (MTCL) 0 (MTCM)	27 (MTCL) 0 (MTCM)	28.5 (MTCL) 0 (MTCM)
	51-100	13	19	27	28.5
	101-200	43	49	51	51
	201+	-	-	69	68.5
FA		8	8	10	10
FB		13	13	16	16
GA		7.5	8	9	9
GB		11	11	10.5	11.5
GC		8	10	10.5	13.5
GD		13	15	12.5	12.5
GE		11	11	10.5	11.5
H		58	64	83	93
J		18	19	25	28.5
K	0-30	15	17	29	29
	31-100	25	27	39	39
	101-200	60	60	77	77
	201+	-	-	117	117
LL		10	10	12	12
L1		6	6	6	6
L2		3	3	3	3
M		M5 X 0.8	M5 X 0.8	M6 X 1.0	M6 X 1.0
ML		10	12	13	15
MM		M4 X 0.7	M5 X 0.8	M5 X 0.8	M6 X 1.0
N		5	5	17	17
NN	0-30	20	24	24	24
	31-100	40	44	44	44
	101-200	110	110	120	120
	201+	-	-	200	200
P		4.5	4.5	5.5	5.5
PA		3	3	3	4
PP		3.5	3.5	3.5	4.5
P1		M5 X 0.8	M5 X 0.8	1/8 NPT	1/8 NPT
Q		14	16	18	26
QL		48	54	70	78
R		23	24	28	34
RR		41	46	54	64
T		8	8	9.5	9.5
TL		4.5	4.5	5.5	5.5
V		37	38	44	50
VA		7.5	7.5	8.5	8.5
VB		4.5	4.5	5.5	5.5
VC		4	4	4.5	4.5
VD		2	2.5	3	3
VE		6.5	7	8	8.5
W		26	30	36	42
WA		50	56	72	82
WB		18	22	24	30
WL		56	62	81	91
WW		22	25	30	38
Y		6	8	10	12

	Stroke (mm)	Bore Size (mm)			
		32	40	50	63
A	0-50	65 (MTCL) 78 (MTCM)	66 (MTCL) 78 (MTCM)	76 (MTCL) 89 (MTCM)	77 (MTCL) 89 (MTCM)
	51-100	102	102	118	118
	101-200	118	118	134	134
	201+	140	140	161	161
B		59.5	66	72	77
C		37.5	44	44	49
D		16 (MTCL) 20 (MTCM)	16 (MTCL) 20 (MTCM)	20	20
E	0-50	5.5 (MTCL) 18.5 (MTCM)	0 (MTCL) 12 (MTCM)	4 (MTCL) 17 (MTCM)	0 (MTCL) 12 (MTCM)
	51-100	42.5	36	46	41
	101-200	58.5	52	62	57
	201+	80.5	74	89	84
FA		12	12	16	16
FB		22	22	28	28
GA		9	10	11	13.5
GB		12.5	14	12	16.5
GC		15	18	21.5	28
GD		7	13	9	14
GE		12.5	14	14	16.5
H		112	120	148	162
J		34	38	47	55
K	0-40	33	34	36	38
	41-100	45	46	48	50
	101-200	83	84	86	88
	201+	121	122	124	124
LL		16	16	20	20
L1		6	6	8	8
L2		3	3	4	4
M		M8 X 1.25	M8 X 1.25	M10 X 1.5	M10 X 1.5
ML		20	20	22	22
MM		M8 X 1.25	M8 X 1.25	M10 X 1.5	M10 X 1.5
N		21	22	24	24
NN	0-40	24	24	24	28
	41-100	48	48	48	52
	101-200	124	124	124	128
	201+	200	200	200	200
P		6.5	6.5	8.5	8.5
PA		4	4	5	5
PP		4.5	4.5	6	6
P1		1/8 NPT	1/8 NPT	1/4 NPT	1/4 NPT
Q		30	30	40	50
QL		96	104	130	130
R		42	50	66	80
RR		78	86	110	124
T		11	11	14	14
TL		7.5	7.5	9	9
V		63	72	92	110
VA		10.5	10.5	13.5	18
VB		6.5	6.5	8.5	11
VC		5.5	5.5	7.5	10
VD		3.5	4	4.5	7
VE		9.5	11	13.5	18.5
W		48	54	64	78
WA		98	106	130	142
WB		34	40	46	58
WL		110	118	146	158
WW		44	44	60	70
Y		16	16	20	20

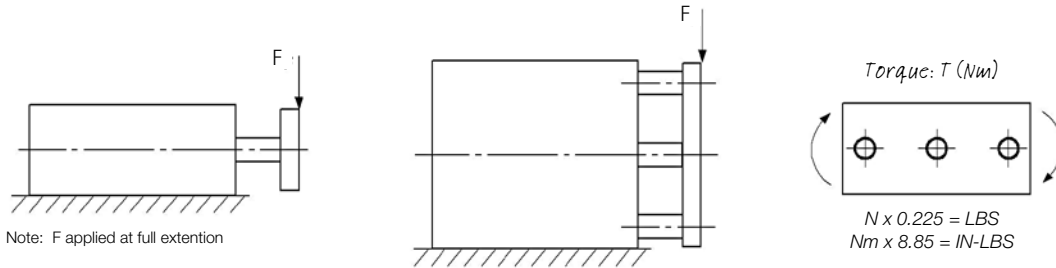
Maximum Recommended Loads



Bore Size (mm)	Type	Maximum Side Load (N)																	
		Stroke (mm)																	
		10	20	25	30	40	50	60	70	75	80	90	100	125	150	175	200	225	250
12	MTCM	44	33	29	26	41	36	30	28	26	25	24	22	19	17	-	-	-	-
	MTCL	37	27	25	22	35	30	27	24	23	21	19	18	15	12	-	-	-	-
16	MTCM	67	51	42	37	63	58	49	41	37	35	33	32	27	24	22	20	-	-
	MTCL	54	40	37	32	54	47	42	38	35	32	30	28	23	20	17	15	-	-
20	MTCM	-	78	61	57	123	112	99	91	87	84	79	75	66	59	54	49	45	42
	MTCL	-	58	52	48	101	90	83	74	70	69	63	58	62	54	48	43	39	35
25	MTCM	-	93	89	76	142	131	119	107	101	97	90	85	68	79	71	65	61	55
	MTCL	-	82	79	68	132	118	109	99	93	88	81	77	80	70	62	55	50	45
32	MTCM	-	-	203	190	179	164	221	197	182	172	163	157	142	127	116	106	98	91
	MTCL	-	-	191	182	166	157	207	178	164	156	150	144	203	186	171	158	146	137
40	MTCM	-	-	203	190	179	164	221	197	182	172	163	159	142	127	116	106	97	91
	MTCL	-	-	190	182	166	157	210	179	163	156	150	144	203	185	171	158	146	137
50	MTCM	-	-	296	283	268	245	303	288	273	266	253	241	216	195	179	164	155	142
	MTCL	-	-	208	196	185	173	259	232	223	212	207	199	264	242	224	207	195	181
63	MTCM	-	-	296	283	268	245	303	288	273	266	253	241	216	195	179	164	153	142
	MTCL	-	-	206	196	180	171	259	232	221	212	205	196	262	240	221	205	191	178

How to Order

Maximum Recommended Loads



Bore Size (mm)	Type	Maximum Torque (Nm)																	
		Stroke (mm)																	
		10	20	25	30	40	50	60	70	75	80	90	100	125	150	175	200	225	250
12	MTCM	0.90	0.79	0.71	0.65	0.77	0.72	0.65	0.53	0.50	0.47	0.41	0.36	0.31	0.27	-	-	-	-
	MTCL	0.61	0.45	0.40	0.35	0.58	0.50	0.44	0.39	0.37	0.35	0.32	0.29	0.24	0.20	-	-	-	-
16	MTCM	1.21	1.04	0.94	0.88	1.23	1.11	0.99	0.72	0.69	0.65	0.61	0.58	0.50	0.44	0.40	0.36	-	-
	MTCL	0.99	0.74	0.66	0.59	0.99	0.86	0.77	0.69	0.65	0.61	0.57	0.52	0.43	0.37	0.32	0.28	-	-
20	MTCM	-	1.57	1.42	1.31	2.39	2.15	1.97	1.90	1.88	1.86	1.72	1.63	1.44	1.28	1.16	1.06	1.01	0.90
	MTCL	-	1.26	1.14	1.03	2.17	1.94	1.79	1.59	1.52	1.46	1.33	1.25	1.34	1.17	1.03	0.93	0.88	0.76
25	MTCM	-	2.40	2.22	2.01	3.66	3.35	3.17	3.06	2.96	2.91	2.77	2.57	2.26	2.02	1.83	1.67	1.57	1.42
	MTCL	-	2.11	1.96	1.75	3.37	3.02	2.71	2.42	2.38	2.33	2.19	1.97	2.05	1.78	1.58	1.41	1.22	1.16
32	MTCM	-	-	6.35	6.00	5.73	5.13	5.98	5.74	5.69	5.62	5.11	4.97	4.42	3.98	3.61	3.31	2.97	2.84
	MTCL	-	-	5.95	5.73	5.44	4.89	5.43	5.15	5.11	5.02	4.70	4.51	6.34	5.79	5.33	4.93	4.33	4.29
40	MTCM	-	-	7.00	6.60	6.11	5.66	6.66	6.31	6.27	6.23	5.86	5.48	4.87	4.38	3.98	3.65	3.34	3.13
	MTCL	-	-	6.55	6.21	5.77	5.39	6.17	5.67	5.62	5.58	5.33	4.96	6.98	6.38	5.87	5.43	5.00	4.72
50	MTCM	-	-	13.0	12.6	11.0	10.8	13.7	12.7	12.0	11.8	11.1	10.8	9.50	8.60	7.86	7.24	6.80	6.24
	MTCL	-	-	9.17	8.75	8.30	7.62	10.3	9.94	9.83	9.77	8.82	8.74	11.6	10.7	9.83	9.12	8.95	7.95
63	MTCM	-	-	14.7	13.6	12.9	12.1	19.4	16.2	13.5	12.7	12.1	11.9	10.7	9.69	8.86	8.16	7.52	7.04
	MTCL	-	-	10.2	9.74	9.20	8.48	17.5	14.0	11.0	10.6	10.2	9.74	13.0	11.9	11.0	10.2	9.63	8.84

The model number of MTC extruded thrusters consists of six alphanumeric clusters designating product, bushing type, bore, stroke, magnet, and ports that together make up the complete part number to use in ordering. Use the ordering information below to build a valid part number.

An example of a basic MTC unit with bronze bushings, 16mm bore, 70mm stroke, magnets, and standard ports is below.

MTC

M

- 16 x 70 - S - T

Product

MTC Extruded Thruster

Bushing Type

M

Bronze Bushing

L

Linear Ball Bushing

Magnet

S with Magnet

Ports

T Standard¹

¹ See page 328 for the Port Sizes listed in the Engineering Specifications table.

Stroke (mm)	Bore Size (mm)							
	12	16	20	25	32	40	50	63
10	X	X						
20	X	X	X	X				
25	X	X	X	X	X	X	X	X
30	X	X	X	X	X	X	X	X
40	X	X	X	X	X	X	X	X
50	X	X	X	X	X	X	X	X
60	X	X	X	X	X	X	X	X
70	X	X	X	X	X	X	X	X
75	X	X	X	X	X	X	X	X
80	X	X	X	X	X	X	X	X
90	X	X	X	X	X	X	X	X
100	X	X	X	X	X	X	X	X
125	X	X	X	X	X	X	X	X
150	X	X	X	X	X	X	X	X
175		X	X	X	X	X	X	X
200		X	X	X	X	X	X	X
225			X	X	X	X	X	X
250			X	X	X	X	X	X

¹ See page 328 for the Port Sizes listed in the Engineering Specifications table.

